

The Mining And Metallurgical Journal

VOL. XIX. No. 2

LOS ANGELES, CAL.,

April 15, 1898,

SAN FRANCISCO, CAL.

Price 15 Cents

Jessop's STEEL

The Best
FOR

Mining Drills,
Tools, Etc.

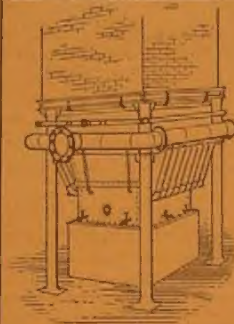
I. WILLARD BEAM,
29 Main Street
SAN FRANCISCO, CAL.

THE EDWARD P. ALLIS COMPANY — MANUFACTURERS OF — Mining, Milling and Smelting Machinery

Crushers, Concentrators, Pumps, Compressors, Hoists, Boilers,
Reliance Crushing Rolls, Reynolds Corlies Engines, &c.

Send for Catalogue.

Milwaukee, Wis.



Smelting Machinery!

WE COVER THIS LINE COMPLETELY

Plants Designed by Experts,
Every Part from Special Designs

HAVE YOU SEEN OUR STEAM STAMP?

The Gates Ore Breaker is known the World Over
We Publish 15 Catalogues

Gates Iron Works,

Dept. 2 650 Elston Ave.
CHICAGO

THE ROESSLER & HASSLACHER Chemical Co.

100 William St., New York

CYANIDE

Peroxide of Sodium

Hyposulphite of Soda

Chloride of Lime

Sulphide of Iron



Trade Mark

And Other Chemicals for Mining Purposes.

Joseph Dixon Crucible Co.

MINERS, IMPORTERS AND MANUFACTURERS

GRAPHITE & PLUMBAGO

JERSEY CITY, N. J.

RETORTS, CRUCIBLES, GRAPHITE LUBRICANTS, BELT DRESSING,
GRAPHITE PAINTS, LEAD PENCILS, AND GRAPHITE
PRODUCTS OF ALL KINDS.

Send for Production Catalogue.

Graphite Makes the Best Lubricant
and Best Paint.

ADAMANTINE SHOES & DIES

AND

CHROME CAST STEEL

Cams, Tappets, Bosses, Roll
Shells and Crusher Plates.

These castings are extensively used in all the Mining
States and Territories of North and South America. Guar-
anteed to prove better and cheaper than any others. Orders
solicited subject to above conditions. When ordering send
sketch with exact dimensions. Send for Illustrated Circular.



Stamp Shoes

Stamp Dies



Stamp Cam

CHROME STEEL WORKS,

Kent Ave. & Keap St., - BROOKLYN, N. Y.

The Pelton Water Wheel

Affords the Most Economical and Reliable Power for Mining,
Electric and all other purposes.

9000 WHEELS NOW RUNNING

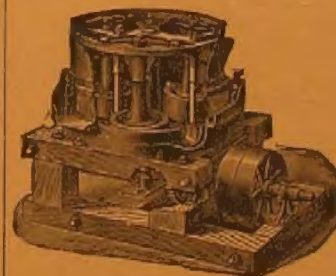
PELTON WATER WHEEL CO., 121 Main St., San Francisco, Cal.

PARKE & LACY COMPANY

21 and 23 FREMONT STREET, SAN FRANCISCO, CAL.

LICENSEE FOR THE MANUFACTURE AND SALE OF

The Huntington Centrifugal Roller Quartz Mill



THE HUNTINGTON MILL is so well and
favorably known among mining men throughout
the world that any description of it would seem
superfluous. They are in use in the United
States, Canada, Mexico, Central and South
America, Australia, China, Japan, and South
Africa. In fact, wherever mines exist, and have
given the best satisfaction of all quartz crushing
mills.

The construction of this mill has lately been much improved and we claim it to be the

CHEAPEST, MOST EFFICIENT, SIMPLEST, AND MOST DUR-
ABLE MILL UPON THE MARKET.

← CATALOGUE UPON APPLICATION →

Refractory Ores

Successfully treated by the

PORTER ELECTRICAL PROCESS

The Porter Gold and Silver
Extraction Company

505 BULLARD BLOCK.

LOS ANGELES, CAL.

Consolidated Kansas City Smelting & Refining Co.

— BUYERS OF ALL CLASSES OF —

BULLION, MATTE, ORE - MILL PRODUCTS, GOLD - SILVER BARS

Smelting Works { Leadville, Colorado.
El Paso, Texas.
Argentine, Kansas.

REFINERIES ARGENTINE KANSAS.

FOLLOWING CODES USED: At Argentine, Kansas,
A. B. C.
Morrison & Mott's
and Bedford, McNeill's.

Ore Purchasing Agencies

{ Spokane, Wash. Salt Lake, Utah.
Leadville, Colorado. Denver, Colorado.
El Paso, Texas. Argentine, Kansas.
Cripple Creek, Colorado

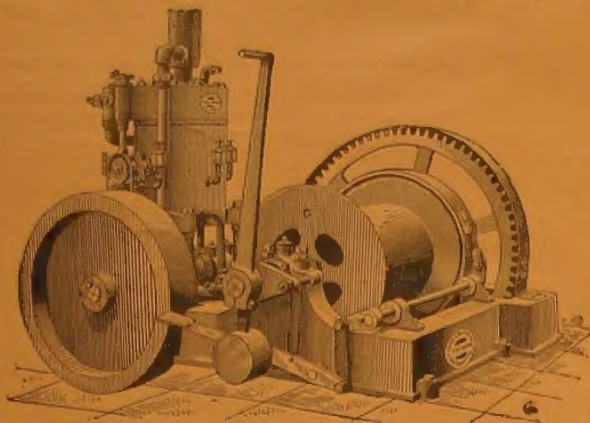
California Vigorit Powder Co.

Manufacturers of

Dynamite High Explosives and "Vigorit Low" Blasting Powder

OFFICE: 208 California Street,
San Francisco, Cal.WORKS: Point Isabel,
Contra Costa Co., Cal.

"Union" Hoist



Union Gas or Oil Engine and Hoist Combined, on strong, iron base.

No Fire No Steam No Boiler No Danger

TEN YEARS' EXPERIENCE. TWO THOUSAND ENGINES IN USE.

Started instantly. Compact, strong, simple, efficient, economical. Perfectly governed, so that oil is used only in proportion to the work done. No expense when idle.

Particularly Adapted to Mining in Localities Where
Fuel and Water are Expensive.Built in the following sizes:—1 H.P., 4 H.P., 6 H.P., 8 H.P., 10 H.P., 15 H.P.,
20 H.P., 30 H.P., 40 H.P.

Send for Catalogue and state what H. P. required.

Union Gas Engine Co.,

301 Howard Street,

San Francisco, Cal.

YUKON BOATS AND SLEDS

Stern Wheel Boats, 25 ft. to 200 ft. in length. Light draught.
Shipped—knocked down—and set up ready to run. Send for circulars and prices.

SAN FRANCISCO LAUNCH CO. Cor. of North Point and Stockton Sts. San Francisco, Cal.

The only Genuine ALBANY GREASE
has this TRADE MARK on every package.
Look out for Yellow Label.MANUFACTURERS OF
Albany Dynamo & Albany Cylinder Oils
If you are not using these Oils give them a trial
at once, and we know the result. You will want
no other.

ALBANY GREASE

Lubricates Everything

Especially Adapted to Mining and Milling Machinery.

—MADE ONLY BY—

Adam Cook's Sons

313 WEST ST., NEW YORK.

BRANCHES:

55 S. Canal Street, Chicago, Ill.

34 Fremont St., San Francisco, Cal.

FRANCIS SMITH & CO.,

—MANUFACTURERS OF—



SHEET IRON & STEEL PIPE

MINING PIPE ALL SIZES

Hydraulic, Irrigation and Power Plants, Well Pipe, Etc., all Sizes.

Iron cut, punched and formed, or making pipe on ground where required. All kinds of Tools supplied for making pipe. Estimates given when required. Are prepared for coating all sizes of Pipes with Asphaltum.

180 Beale Street

San Francisco, Cal.

RAINBOW PACKING

THOUSANDS OF
IMITATORS.
NO EQUAL.
WILL HOLD
HIGHEST PRESSUREDon't have to use
Wire and Cloth to
hold RAINBOW.
Can't blow it out.

THE COLOR OF RAINBOW PACKING IS RED

Three rows of Dia-
monds in Black
throughout the
length of each
and every roll.No baking or
following up.

PATENTED AND MANUFACTURED EXCLUSIVELY BY

PEERLESS RUBBER MFG. CO.,**16 WARREN ST., NEW YORK**

10-24 Woodward Avenue, Detroit, Mich.

202-210 S. Water Street, Chicago, Ill.

Dunham, Corrigan & Hayden Co., San Francisco, Cal.

THOMSON & BOYLE,



MANUFACTURERS OF

RIVETED STEEL

MINING PIPE,

MADE OF BEST SHEET STEEL.

Water Tanks, Oil Tanks, Steam Boilers, Ore Cars, Ore Buckets, Etc., Etc.

Correspondence Solicited

312-316 Requesena St.,

Los Angeles, Cal.

WILLIAM H. EMANUEL,

REPRESENTING

RAND DRILL COMPANY,
THE EDW. P. ALLIS CO.,Air Drills and Compressors
General Mining, Milling and Smelting
Machinery and Reynolds Corliss Engine
Wire Rope and Bleichert Tramways
General Service and Mining Pumps

TRENTON IRON CO.,

HENRY R. WORTHINGTON,

ROBIN'S BELT CONVEYOR

DENVER

COLORADO

RICHARD L. COLBURN,Stock and
Mining BrokerMember of
Salt Lake Stock and
Mining ExchangeSALT LAKE CITY,
UTAH.

Practical Books

FREE to any address on application, our
large complete book catalogue of
1896 pages, containing work of a
scientific nature. The latest books of interest
to Miners, Millmen, Engineers, Electricians,
Machinists, Civil Engineers and Works on
Smelting and Metallurgy. SEND FOR IT AT
ONCE.**NORMAN C. HENLEY & CO.**

132 Nassau St.,

New York

TRIPP METALLIC PACKING

FOR
PISTON RODSMining Trade
Specialists

WM. B. MERRILL & CO.,

SOLE MANUFACTURERS

Office and Factory,

995 Congress Street

BOSTON, MASSACHUSETTS

W. N. JERU.

Assay Office and Chemical Laboratory

Rooms 46 and 47 Montgomery Bldg.

628 MONTGOMERY ST., SAN FRANCISCO, CAL.

Ore assays analyses of minerals, metals
and their alloys, etc. Lessons given in assaying

WOODBURY CONCENTRATOR



No. 141 First St., - San Francisco

McDearmon & Co.

Asbestos Boiler & Steam Pipe Coverings

Asbestos Cement for Boilers, Drums, Heaters,
Etc. Special facilities for supplying
the mining trade.Pacific Coast Agent for H. W. John's Co.'s Asbestos
Sectolite Coverings.

1009 S. F. STREET, - San Francisco, Cal.

MACHINERY

STAMP MILLS, Marine and Stationary
ENGINES and BOILERS, Saw Mills and all
kinds of new and second hand machinery.

Send for Catalogue

WASHINGTON MACHINERY DEPOT
TACOMA, WASHINGTON

J. W. Paxson Co.

FOUNDRY

Facings, Supplies, Equipments

COMMERCIAL DISTRICT

Philadelphia, Pennsylvania

1

五

Q

13

10

2

100

5

10

I

24

may

ing time

2019

10

2

1109

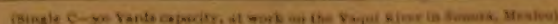
100

NEWARK, NEW JERSEY

And Placer Mining Machines, & since

AGENTS FOR

KANSAS CITY, MISSOURI



CHAS. C. MOORE & CO.

ENGINEERS AND DEALERS IN

BABCOCK & WILCOX BOILERS, GREEN'S ECONOMIZERS,
 McINTOSH & SEYMOUR ENGINES, WHEELER CONDENSERS,
 HAMILTON CORLISS ENGINES, BARNARD-WHEELER COOLING TOWERS,
 N. Y. SAFETY AUTOMATIC ENGINES, HOPKES LIVE STEAM PURIFIERS,
 GOUBERT FEED WATER HEATERS, EDMISTON FEED WATER FILTERS,
 STRATTON STEAM SEPARATORS, BUNDY STEAM TRAPS,
 SNOW STEAM PUMPS, SPENCER DAMPER REGULATORS,
 QUIMBY SCREW PUMPS, HYATT ROLLER BEARINGS.

Watch this Space for description of the above Machinery.

Send for Catalogue and Full Information.

19 First Street, San Francisco, Cal.



GOODYEAR'S
RUBBER GOODS

Miners and Mining

GATHERING RUBBER Crack Proof Boots, White Rubber Coats, Oil Clothing

BELTING, PACKING AND HOSE

573, 575, 579 Market Street,
SAN FRANCISCO, CAL.

73 and 75 First St.
PORTLAND, OREGON



Diamond - Pointed
Core Drills

AMERICAN
DIAMOND ROCK DRILL CO
130 Liberty St., New York.
P. O. Box 1442.

COMPLETE
MINERAL CATALOGUE

186 pages with 40 engravings; contains table giving name, composition and form of all known minerals with other valuable lists and tables. The best book of the kind ever published, for students, prospectors, mining experts, chemists and others. Prices post paid, paper 25c, cloth 50c; calf \$1.00. SPECIMENS PURCHASED of Ores or fine crystallization. Correspondence invited. PRICE LIST FREE.

Dr. R. E. Foote, Arch St., Philadelphia, Pa.
Established 1876

JENA Trade Mark **BEST GLASS**
Normal Glass **SCHOTT & GEN.** FOR Laboratory Use **JENA**

CHEMICALS AND
CHEMICAL APPARATUS

ASSAY BALANCES
Finest Ever Made

Specialties: Analytical Portable Balances, Porcelainware, Platinum goods, Crucibles, Cupels, Scorifiers, Muffles, Furnaces, C. P. Acids, etc.

Everything Necessary for Assayers

Elmer & Amend,
3d Ave. Cor of 18th St. New York

Advertise in The Journal

J. HOWARD WILSON
Assayer and Chemist

A Specialty Made of Umpire Work.

306 Santa Fe Ave., Pueblo, Colo.

The Standard Authority

One Volume, Small Quarto, 311 Pages, 72 Illustrations, \$5.00.

A Practical Treatise on
Hydraulic Mining in California
By AUG. J. BOWIE, JR., Mining Engineer

CONTENTS
The Records of Gold Washing. General Topography and Geology of California. The Distribution of Gold and Deposits, and the Value of Different Strata; Amount of Workable Gravel Remaining in California; Preliminary Investigations. Reservoirs and Dams; Measurement of Flowing Waters, Ditches and Flumes; Various Mechanical Appliances; Blasting Gravel Banks, Tunnels and Sluices; Tailings and Dump; Washing or Hydraulic Mining; Distribution of Gold in Sluices; Loss of Gold and Quicksilver; Duty of the Miner's Inch; Statistics of the Costs of Working; and the Yield of Gravel.

D. VAN NOSTRAND CO., Publishers
23 Murray and 27 Warren Sts., New York

Copies sent by mail on receipt of Price

CONSOLIDATED PIPE COMPANY,
IRON AND STEEL WATER PIPE A SPECIALTY



73-889 STEPHENSON AVENUE, LOS ANGELES, CAL.

A. C. HARPER, Proprietor.

Telephone Main 420

Post Office Box 867

THE COLORADO and CALIFORNIA Mineral Developing Co.

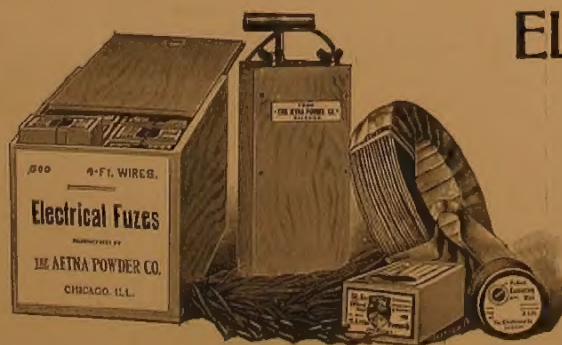
433-4-5 STIMSON BLOCK, LOS ANGELES, CAL.

Prospecting, Developing of Mines, Mine Operators, Locating, Buying and Selling of Mines a Specialty, Financial Agents for Eastern Capitalists.

GAIL BORDEN, President
GAY W. BROWN, Vice-President
J. K. HAWK, Secretary

CAPITAL STOCK, \$200,000

Correspondence Solicited



Send for our illustrated pamphlet

ELECTRICAL FUZES

BLASTING MACHINES
LEADING WIRE
CONNECTING WIRE

THE AETNA POWDER CO.

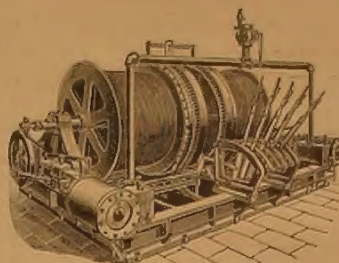
188 MADISON STREET
CHICAGO - ILL.

A NEW MORTAR
That is a crusher and pulverizer combined.

Weight 110 lbs., Diameter 10½ in.; Height 8½ in.
Fills a long-felt want. Send for descriptive circular. Crusher Pulverizer No. 1, \$35.00.
J. E. Surman & Co., 103 E. 14th St., New York.

Lidgerwood Hoisting Engines

Built to gauge on the Duplicate Part System. Quick Delivery Assured.

**Mine Hoists, CABLEWAYS**

Conveying Devices, for Mining, Quarrying, Logging, Dam Construction, &c.

Electric Hoists and Appliances

Lidgerwood Mfg. Co.

96 LIBERTY STREET, NEW YORK Also PORTLAND, OREGON

ORE TESTING

Complete mill for testing ores on practical scale by all processes to determine the best process adapted to treating any ore submitted. Processes in use investigated to overcome unnecessary losses, etc.

RICKETTS & BANKS,

Metallurgists & Chemists

No. 104 JOHN STREET,

NEW YORK CITY

J. A. Fay and Eagan Co.

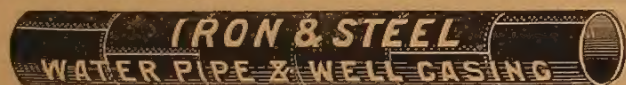
CINCINNATI, OHIO

Wood Working Machinery

— FOR —

Box Factories, Planing Mills, Sash, Door & Blind Factories
Carriage, Wagon and Agricultural Shops.

HENSHAW, BULKLEY & CO., Agents, San Francisco, Cal.

THE NATIONAL IRON WORKS

Riveted Boilers, Tanks, and Sheet Steel or Iron Work of every description.

MANUFACTURER OF THE

National Steel Ore Car

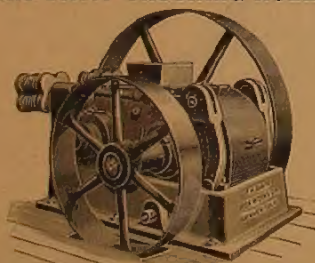
Repairing of All kinds Promptly Attended to.
PORTLAND, OREGON

The F. M. Davis Iron Works Co.

Office and Works 723 to 743

LARIMER STREET,

Corner 8th Street, DENVER, COL.

The DAVIS CRUSHING ROLLS**SIMPLE, DURABLE, EFFICIENT**

These machines are built in 5 sizes 27"x14". Belt Driven, \$950.00. Weight 13,000 pounds.

SEND FOR CATALOGUES and DISCOUNTS

OUR New Book

ESSAYS UPON

Boiler Incrustation and Corrosion.
Boiler Explosions, The History of
Natural Water Contamination.

BY GEO. W. LORD, is now ready

We will send this interesting little book free of cost to

EVERY SUPERINTENDENT
OR ENGINEER

Who will state his occupation, By whom employed, Total Boiler capacity, What Scale preventive he is using, The cost of the article, And how long the supply will last. Address

Geo. W. Lord, Philadelphia Pa.

J. B. TOMLINSON, M. E.

Prescott, Arizona,

MINING PROPERTIES EXAMINED, AND
PRAISED AND REPORTED UPON

— AND —

Supervision taken of the development of prospects and the operation of mines.

S. S. MACHINERY CO.

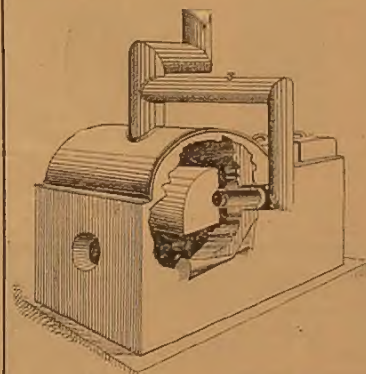
Buy, Sell and Trade in All Kinds of SECOND-HAND
Mining and Wood-Working Machinery.

CORRESPONDENCE SOLICITED.

OFFICE: 1529 Lawrence
WORKS: Sixth and Market

DENVER, COLORADO

TELEPHONE Office, 129
Works, 1224

LONERGAN & CALKINS' Combined Melting and Muffle Furnace,

"This cut shows the Oxidizing Bonnet by which a continuous flow of fresh air controlled by a damper is passed through the muffle."

LONERGAN & CALKINS,

Gold and Silver Refiners,
Assayers and Bullion Buyers.

127 West First Street,

LOS ANGELES, CAL.

THE TRUAX PATENT IMPROVED**AUTOMATIC ORE CARS**

Manufactured by

CHAS. B. BOOTHE & Co.

126-128

SOUTH LOS ANGELES ST.

LOS ANGELES, CAL.



Pat. Jan. 2, 1892, Pat. Aug. 27, 1895.

Send for our Catalogue and Prices

Bullock's Diamond Prospecting Core Drills

These are the only Machines which will give absolutely accurate records of borings. Fifteen styles and sizes. Operated by hand, horse, steam, air or electricity.

Monarch Rock Drills

Any style of mounting. Simple, compact, economical. Operated by air or steam
Hoisting and Haulage Machinery to fill any requirements.

M. C. BULLOCK MFG. CO.,

1178 West Lake Street,

CHICAGO, ILLINOIS

*** SCHOOL OF ***

Practical Mining, Civil, Mechanical,
Electrical Engineering, Metallurgy,
Cyanide Process, &c.

Surveying, Architecture, Drawing and Assaying.
933 MARKET ST. SAN FRANCISCO, CAL.
OPEN ALL YEAR

A. VAN DER NAILLEN, President.
Assaying of Ores, \$45; Bullion and Chlorination
Assay, \$25; Blowpipe Assay \$10. Full Course
of Assaying, \$50. Established 1864.
Send for Circular.

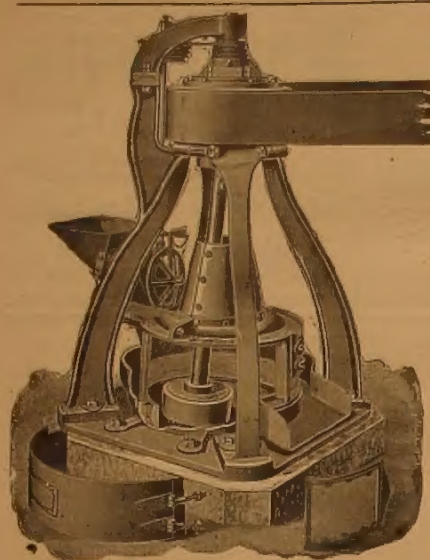
PETER HEER,

232-234 E. Washington St., CHICAGO

Manufacturers of Highest Class

Engineering and Mining Instruments,

T-Squares, Triangles, Scales, Etc. Repairs carefully and promptly executed. Drafting Supplies of all kinds. Catalogue on application.



THE GRIFFIN MILL

The only Perfect Pulverizer Working both Wet or Dry Process

NO JOURNALS IN PULVERIZING CHAMBER.

Delivers a finished product. Will pulverize 1 to 2 tons per hour on Portland Cement, Quartz or ores depending on hardness of material and firmness of product.

— Manufactured and Sold by —

Bradley Pulverizer Co.,

92 STATE STREET,
Boston, Mass.

HADFIELD'S MANGANESE STEEL,

HARD, TOUGH.



Best Metal known for Stamp Shoes and Dies, Roll Shells, Crusher Plates and Side Liners. Toggles and Toggle Bearings, Gyratory Cones and Concaves or Liners, Mine Car Wheels, Coal Crushing Rolls, Etc., Etc.

TAYLOR IRON AND STEEL CO.,

Sole Licensees in America under Hadfield System and Patents. High Bridge, N. J., U. S. A.

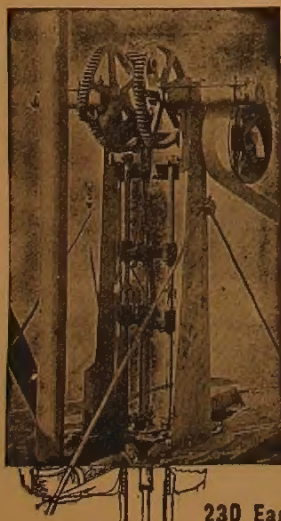
KEUFFEL & ESSER CO.
NEW YORK.
127 FULTON AND 42 ANN STS.
Branches: 111 Madison St., Chicago; 708 Locust St., St. Louis

Drawing Materials and Surveying Instruments

The largest and best assorted stock in America. All requisites for field, mine, and draughting room. We have made a study of this line, and our goods are warranted to be as nearly perfect as it is possible to make them. Prices reasonable. Write for catalogue

Agent FULTON POWER PUMPS

With Capacities up to 30,000 gallons per hour.
Made by A. T. Ames, of Galt, Cal.



Fred. F. Hunt, E. M.

* Chemist and Assayer

Weighing, Sampling and Assaying all Mineral Products
Specialties: Lead, Bullion and Umpire Assays
Samples by Mail or Express.
77 Pine Street, New York City

LAMBERT

Gas, Gasoline and
Distillate Engines

TANKS, PIPE
and WATER
SUPPLY
GOODS



Call on or Address,

S. J. SMITH,

230 East Fourth Street,

LOS ANGELES, CAL.



The Mining and Metallurgical Journal

Is the best Medium in which to make your

Wants

known. Reliable information furnished about all classes of Mining, Milling and Smelting Machinery.

Offices :

Stimson Block, Los Angeles, Cal.
64-65 Merchants' Exchange,
San Francisco, Cal.



KEYSTONE LUBRICATING GREASE

The only grease adapted to all temperatures. It will not splash or drip like oil.



Our goods are not for sale by the jobbing trade. If you want the genuine Keystone Grease it can only be obtained from us.

A full set of brass cups furnished FREE on first purchase

Especially adapted for Air Compressors and all kinds of Machinery in connection with Mines, Mills and Smelters. Send for trial sample and Cup Free of Charge.

Keystone Lubricating Co. 20th Allegheny Ave. Philadelphia, Pa.



The Harrington & King Perforating Co.,

127 N. Union St., Chicago Ill.

Eastern Office, 284 Pearl St., New York.

ENTERED AT THE POST OFFICE AT LOS ANGELES, CALIFORNIA
AS SECOND CLASS MAIL MATTER.

F. W. EDELSTEN, Editor.

JOHN STEWART.

Special Contributor.

ULRICH KNOCH, Publisher

OFFICES (Stimson Block, Los Angeles, Cal.
64-65 Merchants Exchange, San Francisco, Cal.

SUBSCRIPTION PRICE:

For United States, Mexico and Canada.....						\$2.50 per annum
"	"	"	"	"	"	1.25 six months
All other countries in the postal union.....						3-50 per annum
"	"	"	"	"	"	1.75 six months

ISSUED SEMI-MONTHLY

SPECIAL REPRESENTATIVES:

The Journal is kept on file at the following places where contracts for advertising can be made :

Denver, Colorado—Ed. P. Eppich & Co., 29 Bank Building.
Salt Lake City, Utah—Lester Wallach Adv. Agency, 15 W.
and South Street.

Vancouver, B. C.—E. E. Galloway, Arcade.
Chicago, Ill.—E. Sprague, 50 Dearborn Street.

City of Mexico, Mexico—O. H. M. Agramonte, 17 Cinco De Mayo.

ADVERTISING RATES FURNISHED ON APPLICATION.

NOTHING WILL ARREST ITS PROGRESS.

The MINING AND METALLURGICAL JOURNAL will go ahead in war or peace, whether times are good or bad. It was started and has been kept up with a determination to render valuable service to the public and to make it a success. The management has spared no pains or expense to give extended information on mining and metallurgical subjects. It has correspondents in all the mining camps, and, as its advertisements show, it conveys information that will enable miners and those engaged in ore treatment of whatever character to obtain the requisite machinery and appliances, and to acquire knowledge of the best processes.

We are happily in possession of abundant evidence that the efforts of the JOURNAL are appreciated; this evidence is in the enlargement of its circulation and increase of advertising patronage. The proprietor and editor takes a profound interest in the great mining industries of the nation, and is a source of personal happiness that he is in a position to aid their development. He selected Los Angeles and San Francisco as places in which to prosecute his work, because the former is a new and rapidly-growing city, and is situated so as to command support from the mining interests, and from it there are excellent conveniences for distributing knowledge on mining subjects, and for stimulating mining interests proximate to it, contribute in no small degree to its prosperity and growth, and the latter, (San Francisco), because it is an old and well known mining section, with numerous resources behind it.

Knowing that mineral productions are among the most important in domestic consumption, and in both domestic and foreign commerce, the JOURNAL will emphatically devote itself to their increase, and in doing this it will perform its part in making Los Angeles and San Francisco the commercial and industrial centers on the western coast of the republic.

The *Mining and Scientific Press*, of 2nd April, says "Two mining cases last month strikingly illustrate the necessity for change in our mining laws, so that well-meaning and intelligent judges can render at least approximately correct decisions."

If the writer of the above had said that a change was necessary in our present manner of administering justice in mining disputes, by having such cases arbitrated upon by a State Commissioner of Mines, assisted by two experienced mining engineers representing each side of the case, at the ground in question, and with the evidence and cause of trouble before them, in place of having it tried in courts of law before lawyers who do not understand mineral conditions, the case would be more correctly stated. The chief evil in our mining laws at present lies in our wrong manner of dealing out justice by lawyers who have not seen the ground in question, and whose business it is to litigate and carry on the fight. The doctors in the case differ, and the patient, which is the mining industry, either dies, or has to pay costly legal expenses as a remedy, for what is too often not a just decision on account of the conditions of the case having been falsified by a clever lawyer, or with the aid of over-zealous witnesses.

"The suit was E. R. Morse against the Montana Ore Purchasing Co., which was tried in the United States Court. Judge Knowles, who patiently gave attention to the case, plainly stated his inability to feel satisfied with his own decision. The fact that about twenty mining experts testified to contradictory statements, probably increased the judge's perplexity."

Had the judge been a mining man of experience, taking the evidence on the ground, in presence of the witnesses, such a condition would not be possible. The evil does not lie in our mining laws, but in our wrong manner of dealing out justice between miners on adjoining claims. The fact is, that in the east, where the square or large location is in force, the owners will have disputes as to the boundaries of claims, and to ore bodies dipping under the boundaries, where they are divided by vertical lines, just as much as under the Federal mining law where the just boundary for the miner is recognized, which is the extra lateral right to follow the dip of the vein or deposit. The evil exists then in our wrong manner of settling mining disputes by lawyers in courts of law, instead of by mining men by arbitration on the ground.

EXCITEMENT AND ITS EFFECTS.

The influence of storm upon the atmosphere is like that of excitement upon the human mind. Americans are not the most excitable people in the world, but being of mixed Celtic and Teutonic lineage, they are less excitable than the southern European, and more so than the northerners. Unusual excitement is a disturber of business. We have experienced this in connection with the Spanish imbroglio. It has disturbed the tradesman, the farmer, and others engaged in commercial and industrial pursuits. The miners who delve under ground are perhaps less disconcerted than any of the industrial classes. Business is more active only with those engaged in manufacturing war supplies. Speculation is depressed, for no one is able to calculate what influence war will have upon future values.

There were before Congress sharp issues which promised spirited and protracted discussion. The annexation of Hawaii has given way to the consideration of war measures and talk upon the money question has ceased for the time, and it will probably not be resumed during the present session, nor during the life of the present congress. The silver question and the money system seem destined to remain as they are until a new Congress is chosen and convenes for work.

The merits of the present money system have been discussed upon theoretical grounds, but the delay which seems inevitable may demonstrate its evil or valuable features, its practicability. In the mean time, affairs will jog along uninterrupted by prospect of monetary changes. The greenbacks received their birth from the war of the rebellion. War creates a demand for a larger money volume on account of the extraordinary expenditures of the government, and a war with Spain of considerable magnitude might have the effect to restore government notes to something like their former volume. Events may have the effect to radically revolutionize ideas on the money question. An irresistible demand for more money might result in forcing the adoption of free silver coinage and demonstrate the inadequacy of the single gold standard to supply extraordinary wants.

Meantime, let our miners delve on, whether in the production of gold, silver, lead or copper. There is no cause to fear that their labors will receive less reward in future than in the past, except in the lessening of the outputs. War may temporarily reduce demand for some of the minerals, but for others it will increase it. So far as prices are concerned, we do not look for appreciable reduction. If war takes place, the people will know how to deal with the situation, and it will be the same in regard to peace. It is uncertainty that disturbs and tantalizes. It has had this effect for the last two months.

THE RUSH UNABATED.

Though, in addition to the unusual hardships and exposures, and sickness and death, there are failures and discouragements which cause thousands to return in disgust, yet the rush to the Klondike and the Yukon valleys continues unabated. Ships from San Francisco and Seattle are loaded with gold-seekers, and, as on return trips they have good passenger lists, it is quite certain that the transportation companies will make more money than any class engaged in mining in that arctic region.

Perhaps the best evidence that gold in quantity exists in that region is that capital is being invested in railroad construction over the mountains and in boats on the rivers, which are only navigable for a few months of the year. As it must be that the placer gold will be shortly exhausted by the myriads engaged in gathering it, there must have been discovered a considerable quartz-bearing gold, and which will require years to exhaust. The large investments required to give the country sufficient rail and steamboat transportation would not be made to supply what cannot be more than a temporary demand. There is little else than gold produced in the country to justify the permanent improvements that seem to be in contemplation.

The rush to Alaska will to an extent lessen the number of idlers in the country, and make room for the employment of those remaining at home. It will also make a market for no inconsiderable quantity of the sur-

plus products of the country, and lead to better prices, for those who go there will be consumers without being producers, and there will be much waste in getting supplies to them. Temporarily, at least, the rush thither will make better times in some localities, whatever the output of gold may be.

We do not look, however, for so much gold production as the optimists have been led to expect from the effusions of florid imaginations which have been published; but we are of the opinion that collapse of the furor, though it will be gradual, will not be distant. The momentum acquired will not immediately expend its force. The Klondike mining fever has reached an unusually high temperature, and it will take more time to cool it off than is common. The reason why the fever has become more than ordinarily severe is the fact that gold has been made more important and valuable by its having had cast upon it larger functions in monetary and commercial affairs than ever before. In popular estimation, it has become the ideal of all that is good in the material world. The passion for it however will die out, on the principle that a craze of any kind has its day.

The United States being a new country, rushing has been the normal characteristic of the people, rushing to gain wealth speedily, while a few have succeeded, the many have failed, and though experience has shown that it is better to be content with gradual and moderate gains, yet the wish has continued, and will still continue, until all fields have been explored and exploited. That time has nearly arrived in this country, and in fact in the entire world. There is very little to be explored outside the arctic and antarctic regions, and they have been tested, so far as productions of the soil is concerned, to the ultimate lines of climatic prohibition.

We opine that long after gold mining in Alaska has ceased to attract enterprise and capital, mining for the precious metals in temperate regions will be flourishing and profitable. The time must be near when excitements will be superseded by steady and persistent efforts in fields which yield unerring results, and such as should be satisfactory to people of good sense and rational ambition. While we do not expect to arrest the rush to Alaska, we think it well that people should follow the dictates of unimpassioned judgment rather than an impulsion created by the exaggerated statements of an excited imagination.

WAR AND ECONOMIC QUESTIONS.

Should there be war, it will not remove the issues on economic subjects; on the contrary, it will tend to make them more conspicuous, and the contest over them more earnest and energetic. The government will need increased revenues, and, consequently, new measures of taxation will be suggested, both external and internal. Increasing duties upon commodities will not tend to increase revenue, as it will restrict importation. It is probable that tariff changes will be by transferring from the free to the dutiable schedules. From this source some additional revenue will be realized, but it will not be great, as in general the value of commodities in the free list is inconsiderable.

There will necessarily be bond issues if the war is protracted, and no doubt the effort will be made to change the law, so as to require them to be paid in gold coin only, instead of generally in coin, as the law now is, and as has been the practice heretofore.

There will have to be a larger volume of the circulating medium, and the question will be raised whether it shall be done by further issue of greenbacks, or an enlargement of the national bank circulation. As silver coinage is a convenient way to increase the money volume, a return to its coinage will no doubt be insisted on. Thus differences on economic subjects are likely to be more earnestly pressed than if the country had remained in profound peace.

The first effect of war is to depress business, and it will be noticeable more especially in foreign trade, as Spain has something of a navy, and she may issue letters of marque and reprisal. Domestic commerce will however speedily recover its former volume; not only that but the volume will be increased, by reason of the government being a large purchaser of war materials and army and navy supplies, and as this will increase demand, prices will be higher and business will resume activity. By reason of this also more money will be required, partly because the volume of traffic will be larger, and circulation cannot be as active, as large sums will be held to pay troops and marines and carry on the transportation of supplies, of ordnance stores, and of food and clothing.

The war may be somewhat eventful, but it does not seem that it can be protracted. During war economic problems are dealt with on different theories than in peace time. The solution of them will be watched with an interest second only to the events of the conflict.

It is probably inevitable that internal taxes will be considerably extended and rates raised on such articles as are already taxed. The young people of the country will have an experience the same as that of the generation on the stage of action a third of a century ago.

CO-OPERATION RECOMMENDED.

The chairmen of the Democratic, Populist and Silver Republican parties have generally issued an address to the American people, in which they concur in recommending co-operative action by the three parties in the impending election for representatives in Congress and members of the legislatures in states where senators will have to be elected to succeed those whose terms expire with the present Congress.

The chief issue which these addresses make is in regard to the money policy. It is needless perhaps to say that they all agree on the subject of silver coinage and in hostility to trusts and monopolies, which are alleged to be formed and operated by the advocates of the gold standard. That on this line the battle will be fought there can be no doubt. The position of the national administration, as represented by Secretary Gage, forces the issue and it is eagerly accepted by the friends of silver coinage. The contest promises to be one of unusual energy for what, in common parlance, is denominated an "off year."

The proposition of the three parties named is not a fusion but a coalition; thence, there is not likely to be the fullest development of strength, for, parcelling out the nominations for office there will inevitably be more or less dissatisfaction. The friends of the gold standard will go into the contest with compactness of organization. It is certain, judging from their action in 1896, that the democrats will not be harmonious, and that a considerable percentage will go over to the repub-

lican party in support of the single standard. The issue on the money question will inevitably lead to a re-organization of political parties. What the result will be in the congressional elections can only be conjectured at the present time. It is desirable that the question should be settled, that there may be certainty in our monetary systems.

The Pelton Water Wheel Company report great activity both in their San Francisco and New York Works, orders for 492 wheels having been filled during the past year, of capacities varying from 10 up to 200 horse power, an increase in number of nearly 100 over that of the previous year. While the majority of these wheels have been sent to the mining districts of the Great West, large numbers have gone to Mexico, China, Japan, Australia, and many other foreign countries, to be used for mining, electrical and various other purposes.

The extraordinary success that has attended the introduction of the Pelton wheel in all parts of the world, indicates that it is more fully meeting the varied requirements of such service than anything ever before introduced, as well as the fact that there is a better appreciation of the value of water powers for all industrial enterprises. Any information relating to this system can be obtained by addressing the Pelton Water Wheel Company, 121-123 Main Street, San Francisco, Cal.

GEORGETOWN, COLORADO,
January 10th, 1898.

WEBER GAS AND GASOLINE ENGINE CO.,
Kansas City, Mo.:

GENTLEMEN—The 10 H. P. Gasoline Hoist bought from your Denver agency has been set up over a shaft underground, 1100 feet from the mouth of the tunnel. The exhaust is carried outside by means of a 4-inch galvanized iron pipe. We began hoisting from a depth of 60 feet, and are now down 175 feet. We only hoist from 25 to 40 buckets per day, as we are sinking, and consume about 3 gallons of gasoline. The mine is situated at an elevation of 10,000 feet above sea level. We are well pleased with the machine and cheerfully recommend it.

Yours truly,

FRANK A. MAXWELL,
U. S. Deputy Mineral Surveyor.

The Lehigh University.

The Register of Lehigh University, at South Bethlehem, Pa., recently issued, shows an attendance of 363 students, divided among courses as follows: Mechanical Engineering 106, Civil Engineering 84, Electrical Engineering 66, Mining Engineering 46, Analytical Chemistry 28, Architecture 10, Literary and Classical Courses 23. The teaching force comprises 42 instructors of all grades, which is in the proportion of one instructor to less than nine students. A careful study of the Register shows that while the University is largely devoted to technical branches, the culture studies, such as English literature, history, modern languages, political economy, and philosophy form quite a large part of the curriculum. Abundant opportunity for practical work is afforded in the physical, electrical and chemical laboratories, and in the summer schools in Civil and Mechanical Engineering. The literary and classical courses are also well equipped.

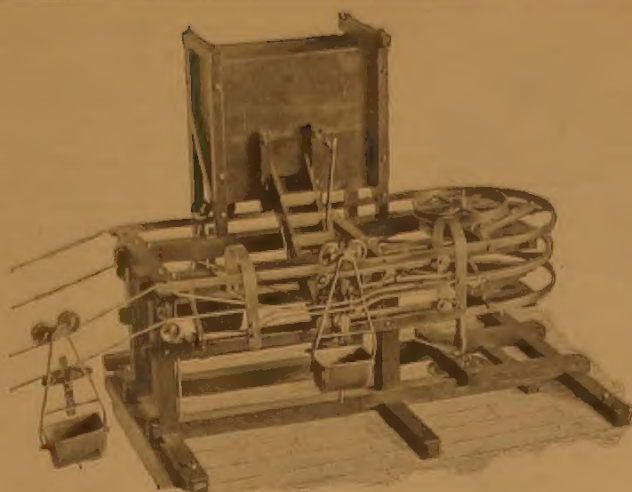


FIG. 1—UPPER, OR LOADING TERMINAL.

WIRE ROPE TRAMWAYS.

The value of Wire Rope Tramways for the transporting of ores from mines to mills, and as feeders to railways for transporting light merchandise, coal, etc., etc., and many other purposes: across mountains, rivers and flat marshy lands or down steep gradients, where rail or wagon roads are impracticable; running by gravity, where there is sufficient difference in level between terminals, or by applied power where there is not; is well understood and cannot be overestimated. The immediate vicinity of a mine does not usually offer the best location for a mill, as some of the natural requirements may be lacking, such as supply of water, cheap fuel, location and accessibility. In such cases the mills are necessarily often located at a distance usually over a rugged contour of surface, and in the development of the mines Wire Rope Tramways deserve the careful consideration of the mining engineer.

The distance tramways may be operated varies from a few hundred feet to several miles.

The Finlayson Patent Automatic Wire Rope Tramways, three views of which we show in connection with this article, presents a cheap and particularly favorable method of transporting ores or other materials, carrying loads up to 1,000 pounds per bucket up or down steep gradients, at a very small cost per ton, frequently making the difference between a paying and a non-paying mine.

The principle of construction is based on the double rope system, in which separate stationary cables are used for the supporting tracks and a lighter hauling or traction rope connecting and moving the buckets, thus doing away with the heavy vibration, as in tramways where the single rope performs the dual function of supporting and hauling the load. The regular ore buckets as used on this system have a capacity of four and a half cubic feet, and are carried on a two-wheel truck moving on the stationary or track rope. At the terminals an iron track is substituted for the standing or track rope.

The distinctive patented features of this system are the automatic terminals, detachable buckets, patent automatic starter for gradually starting each bucket which has been stopped for unloading or loading purposes, and an automatic dumping device.

A carriage located at each terminal (or at any intermediate point along the line) for automatically and gradually starting each

bucket and truck, does away with the jar on the moving rope, which, connecting suddenly to a loaded bucket at rest, causes great wear to clip and rope; also saving the expense of labor and doing away with the arduous and ever watchful duty of the man who watches for the fastening joint on the traction rope, and who gives the final *shove*, to give the bucket a part of the required momentum of the traction rope.

Fig. 1 shows the loading terminal at which the bucket after being filled from the ore chute, is at the proper time automatically and gradually started and becomes attached to a clip which is fast to the hauling rope. The following bucket having previously been detached from the clip is moved along and into position to be loaded and taken along by the next clip.

From cut it can be seen that the loaded bucket has just started out of terminal going on its way down the line. Bucket which is at terminal is loaded and ready to go down the line, as next incoming bucket, after passing around terminal wheel, would be released from the running rope at yoke.

Fig. 2, Lower Terminal, shows the bucket in the act of being dumped. This action is performed by the bucket which is now on the back side of timber work and is going on its way to upper terminal. This bucket which is being dumped, will right itself; will be picked up by the clip which is now attached to the incoming bucket; as this incoming bucket reaches the yoke, shown in the timber work, this bucket will be released from the

clip on the running rope; clip will pass on, pick up the unloaded bucket, and unloaded bucket will start around the end of terminal on its way up the line, and in passing on back side of the timber work, will dump the incoming loaded bucket. As unloaded bucket is being picked up by the clip on traction rope, the loaded bucket is being drawn into place for dumping. The automatic dumping device at this station, turns the bucket upside down returning it to its original position while it is waiting to be taken up by the following clip, and also allows sufficient time for it to be loaded with up-freight, such as coal, lumber, powder, groceries, or any other supplies.

Fig. 3, Complete Line, showing construction of the derricks and at the same time showing how ropes are carried at these supports.

The buckets being detachable allows them to run to any point, where track is provided. This is done by switching in another bucket to take the place of the one switched out and run to point on hanging rail to receive special load.

Derricks, or supports, for stationary rope, are usually from 100 to 300 feet apart. Long spans can be made by using a heavier standing rope over such spans.

The standing rope is usually $\frac{3}{8}$ to 1 inch in diameter on unloaded side, and 1 inch to $1\frac{1}{8}$ inches in diameter on loaded side.

Traction rope is usually $\frac{3}{4}$ inches in diameter.

These, and other valuable features, go to make a tramway system where operating expenses are at a minimum, and anyone contemplating the erection of a tramway cannot afford to overlook this system.

In this system the running rope is always carried on sheaves at just the proper position from the standing rope. By so carrying the traction rope, the great strain on the grip parts at bucket is relieved, and there is no possibility of the clip on the rope tearing itself out of the grips on bucket frames.

This system has been giving very severe tests and is proving itself all the manufacturers claim it to be.

The Colorado Iron Works Co., of Denver, Colo., are the sole manufacturers and sellers of this device.

The Arkansas Valley Smelting Company, located at Leadville, Colorado, has placed an order with the Colorado Iron Works Company of Denver, Colorado, for one carload of water jackets.

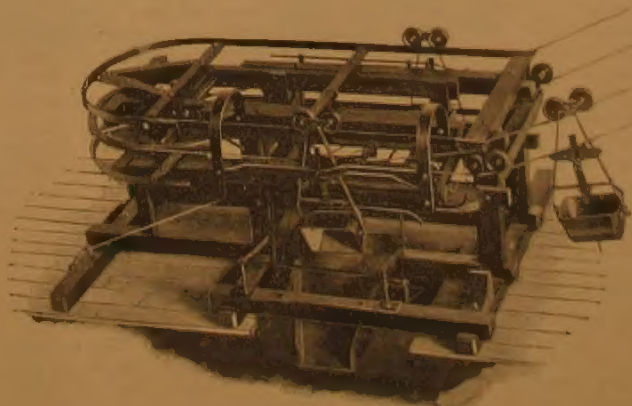


FIG. 2—LOWER, OR UNLOADING TERMINAL.



FIG. 3.—TERMINALS CONNECTED, SHOWING SUSPENDED BUCKETS.

A Mill Testing Plant.

The mining and assaying interests of Southwestern California will welcome the news of the establishment in this city of a complete plant for the practical mill test by all standard methods, of ores of all grades and character. The enterprise is one which the leading industry of the Southwest has long been in need of. It is complete in every detail, and will be able promptly and accurately to demonstrate not only in percentage value of ores, but also the probable expense of milling, and the best methods to be applied.

The new mill is the result of the foresight and enterprise of the well-known assayers, Wade & Wade, who have been recognized among the leading analytical chemists of Los Angeles. For the accommodation of the requisite machinery a site has been selected at No. 234 Requesena street, and an ample building erected. The machinery is all new, of the latest model, and was selected by E. M. Wade of the firm, after two weeks' painstaking investigation at San Francisco and other points. The outfit as selected and now ready for business consists of a two-stamp mill, belt concentrator, automatic ore feeder and large rock breakers, all from the Union Iron Works of San Francisco. In connection with these a complete cyanide plant has been installed, thus enabling the operators to test by cyanide, milling and concentrating. The entire motive force is electric power.

The office and laboratory of the firm are at No. 115½ North Main street, Los Angeles. The latter has no equal in the completeness of its appointments in the western country outside of San Francisco.

A contract has been let for the construction of an electric line for the transmission of power sixty-eight miles in California. This is the longest line for a similar purpose ever built. But another even grander and more elaborate project has been mooted for the construction of a line across Kern river to Los Angeles, a distance of 108 miles. This involves the construction of a dam across the Kern river. The system contemplates a pressure of 30,000 volts. These two projects are the greatest of their kind yet attempted, but Californians never ask the expense of an undertaking; the question is, is it necessary and can it be made to pay? After all the conservatism of which the Pacific coast state is accused, Colorado can take some lessons in the matter of nerve in furnishing money for developing the mining industry. Platt Rogers, in his speech before the exposition meeting at the Mining Exchange, lamented the decadence of the splendid nerve and enter-

prise shown by Denver and Colorado before the panic. Governor Adams hinted at much the same thing. Is it not about time to quit croaking and get down to business again?—*Ores and Metals.*

Patents of Interest to Miners.

Messrs. Townsend Bros., solicitors of patents, 9 Downey Block, Los Angeles, California, report the following list of recent patents of interest to mining men:

March 8, 1898—No. 600,211. Apparatus for Washing Amalgam. Henrik C. F. Stormer, Christiania, Norway. Filed June 26, 1895. A vessel containing a layer of mercury as cathode and a suitable anode, the mixer consisting of a plate normally immersed in and of substantially the same superficial area as the cathode, the plate being reciprocated to agitate the material.

March 15, 1898—No. 600,579. Gold Separator. W. H. Fulcher and S. E. Latta, Stockton, Cal. Filed May 24, 1897. A riffle-crib is secured to a rock-shaft, and a screen-box is also loosely suspended from the shaft; both the crib and the screen are inclined and when the crib is rocked the screen is shaken; riffles are arranged in the bottom of the crib to catch the gold.

March 15, 1898—No. 600,838. Mining Machine. George F. Myers, Boston, Mass., assignor to the Myers Mining-Machine Company, same place. Filed Nov. 18, 1896. The machine comprises cutters secured to sprocket-chains end adapted to swing in an arc of a circle, severing from the face of the drift a Crescent-shaped slice severed at top, bottom and front from the face of the drift.

March 15, 1898—No. 600,635. Quartz Mill. H. H. Crain and J. W. Forbes, Plymouth, Cal. Filed April 23, 1897. Weights are suspended from jointed links and operated by reciprocating arms so arranged that the weights are lifted from the bed on their forward movement and strike the bed with a plunging motion upon the return movement.

March 15, 1896—No. 600,620. Smelting Furnace. W. S. Reese, Natrona, Pa., assignor to the Pennsylvania Salt Manufacturing Company, Philadelphia, Pa. Filed Oct. 21, 1896. A stack smelting furnace for lead materials having a closed porous bottom, an outlet for the smelted material above the bottom, and a receptacle beneath said bottom into which the lead seeps through the bottom.

March 22, 1898—No. 601,203. Ore Car. George E. Truax, Denver, Colorado. Filed April 17, 1897. The car doors are hinged and operated by a rack and pinion arranged beneath the car; a rack is arranged upon the track at the point where the car is to be

dumped, so that the pinion engages with the stationary rack to operate to open the doors upon the forward movement of the car and to close them upon the return movement.

March 22, 1896—No. 601,212. Machinery for Extracting Gold. S. P. Moody, Magalia, Cal., assignor of one-half to Robert F. Jackson, Chico. Filed March 29, 1897. A revolvable pan has an outwardly inclined bottom and a central discharge-opening surrounded by a circular wall; rotary stirring devices project into the pan and rotate in a direction opposite the direction of the rotation of the pan; the pan is given an oscillating angular motion in addition to its rotary motion.

March 22, 1898—No. 601,068. Method of and Apparatus for Extracting Gold from its Ores. F. W. Whitridge, New York, N. Y., administrator of Ernest Werner von Siemens, deceased. Filed May 27, 1896. Patented in Transvaal July 8, 1892. No. 397. The method consists in circulating weak cyanide solution containing gold over anodes of iron and cathodes of lead, the cathodes being formed of thin plates arranged at short distances apart and having from nine to ten square meters of surface for each ton of solution in contact with them; the solution is subject, while in motion, to an electric current of iron 3.5 to four volts and from .5 to 1.5 amperes per square meter of cathode surface.

March 22, 1898—No. 601,201. Method or Process of Extracting Precious Metals from Ores. S. Newhouse, Denver, Colo., and A. J. Bettles and T. Weir, Salt Lake City, Utah. Filed Oct. 8, 1897. The method consisting first, in placing the pulverized ore in a suitable cyanide solution and subjecting it to agitation; second, adding a quantity of zinc thereto and subjecting the mass to further agitation; third, adding a quantity of quicksilver charged with sodium amalgam and subjecting the entire mass to further agitation.

March 29, 1898—No. 601,533. Method of and Apparatus for Reducing and Separating Ores. R. A. Stewart, Cerrillos, New Mexico, assignor of one-half to J. J. Vorpe and Lillie Beale, Van Wert, Ohio. Filed April 29, 1897. The combination with an ore-chamber, means for applying sufficient heat to calcine and reduce the ore to a finely divided condition, of a receptacle adapted to contain a body of water, a submerged centrifugal distributor arranged in the water, and a conduit through which the calcined ore is drawn from the ore-chamber into the centrifugal distributor.

March 29, 1898—No. 601,467. Machine for Winning Stone or Coal. Fritz H. Heise, Gelsenkirchen, Germany. Filed July 27, 1897. Two wedges having parallel outer faces and connected by a screw-spindle are arranged between expansible guiding pieces so that as the wedges are drawn together the expansible pieces are forced apart.

In a report to the Canadian Parliament, Dr. Dawson, chief of the Dominion Geological Survey, places the total yield of gold from the Canadian Yukon mines from 1889 to 1897, inclusive, at \$4,000,500. He gives the amount for each year as follows: In 1889, \$213,500; 1891, \$175,000; 1892, \$187,000; 1893, \$175,000; 1894, \$125,000; 1895, \$250,000; 1896, \$300,000; 1897, \$2,500,000.

The annual meeting of the stockholders of the Great Western (Limited) was held at Revelstoke, B. C., on April 9th.

MODERN WATER POWER.

The use of water for purposes of power dates back to the early centuries, and, even with the crude and primitive means then available was made to subserve many useful purposes. It is, however, only within a comparatively short time that it has come to be recognized as the most practicable and potent of all elemental forces, destined in the near future to do a large part of the world's work.

The advantages such a source of power offers are so many and obvious that even a reference to them seems superfluous. That these advantages have often been largely discounted by the use of appliances for utilization, either altogether unreliable or inadequate to the work intended, is unfortunately quite too common an experience.

The practice which has so long prevailed, of appropriating only the larger streams, with low heads, allowing the higher heads to go to waste, is attended with so many difficulties and such expense as to make a power so obtained often of questionable expediency.

The modern water power wheels offer so many advantages for the general utilization of all these sources of energy, everywhere abounding, that streams favorably situated for power purposes are now being eagerly sought for and appropriated.

By its use the entire force or highest head obtainable can be made available for all industrial purposes with a greatly reduced cost, wider range of application, and fuller adaptation to varying requirements, than has ever before been realized. Nothing in a mechanical way has so signally and quickly demonstrated its own usefulness as well as its right to the first place in hydraulic power appliances.

The transmission of power by electricity has opened up a new field and a wider range for the application of such sources of power, than has been possible by any previous methods, and the field is continually enlarging as the science advances. This most subtle and mysterious element has been brought under control and made subservient to industrial and commercial interests to an extent that can hardly be realized by those not fully conversant with the rapid and important developments of the past few years.

It is, however, in connection with water as an initial force that the highest development in this direction has been attained. Every stream or waterfall is a mine of energy that by means of this most simple appliance can be converted directly into useful effect with almost an entire absence of machinery, and made available for any desired purpose with a high degree of efficiency and comparatively small outlay.

Water that for thousands of years has run to waste, can now be transformed into electrical energy and carried long distances and made as useful as at the point where generated, and at small cost in most cases as compared with steam. The immeasurably vast resources of power available by this means open up in all directions new fields for enterprise, affording profitable employment for both labor and capital.

The idea of a water-power is generally associated with a river or large stream, an expensive dam—huge flume—heavy grading and stone work—massive turbine wheels—pits—curbing and penstock, all involving so large an outlay as to make a power so pro-

In this way a small trout brook will often furnish as much power as a large stream with a low head in a much more convertible form and at probably not more than one-fourth the outlay.

STANDARD MINING CO.

The cut herewith shows an application of Pelton Wheels, manufactured by the Pelton Water Wheel Co. of 121 Main St., San Francisco, Cal., to a high-speed generator by direct connection to the armature shaft. The wheels—four in number—are inclosed in two separate housings all mounted on one shaft and connected to a Westinghouse generator by an insulated coupling. They are 21 inches in

diameter, and have a combined capacity of 400 horsepower, with a speed of 860 revolutions under a running head of 340 feet. The wheels in the plant here referred to were made of this small diameter to give proper speed to the generator under the head in this case available. A slower speed generator—in conformity to modern practice—or a higher head of water, would have admitted of larger wheels, and consequently a less number to give the same power.

The current thus generated is transmitted to the works of the company, $12\frac{1}{2}$ miles distant, at a pressure of 11,000 volts. It is used for running a 60-stamp mill, pumps, hoists, &c. Fuel was exceptionally high in that locality, and it was necessary to obtain cheaper power to admit of carrying on their operation on any extensive scale.

The manager, in his report to the company, states that the cost of the entire plant was \$38,000, and that the saving effected over the previous operation of the plant by steam averaged some \$1,500 per month—thus returning the entire outlay in about two years.

The statement is further made that in the four years the plant has been in operation no trouble has been experienced from the line, though running over a rough and mountainous country, with winter storms of great severity. Also, that no repairs have been required on either wheels or pipe line, and that the service, including regulation, has been at all times

thoroughly reliable and efficient.

Considering the fact that this installation was one of the very first made for mining purposes under new and untried conditions, its success has been the more remarkable.

A COMPARISON.

The wheel illustrated with this article is of the type commonly known as the Over-shot or Gravity Wheel, and is unquestionable the largest and most expensive water wheel ever constructed. It is located at Laxey, on the Isle of Man, a small island in the Irish Sea, off the west coast of England.

"This wheel is 72 feet 6 inches in diameter,



THE GREAT OVER SHOT WHEEL AT LAXEY
ON THE ISLE OF MAN, ENGLAND

duced of doubtful advantage, especially when so much is sacrificed in location of works as is generally necessary in such cases.

Not more than 5 per cent. of the available water-powers in any part of the world, it is claimed, have thus far been utilized—a fact not to be wondered, at considering the crude and expensive methods that have so long prevailed. By means of the present systems only a small diverting dam is required, then a pipe line running along the surface of the ground to the power station which may be located at any convenient point, and high enough to be out of the reach of floods.

and is supposed to develop 150 h. p., which is transmitted several hundred feet by means of wooden trussed rods having supports at regular intervals, to the bottom of which are attached small wheels running on iron ways, for purpose of lessening friction. The power thus transmitted operates a system of pumps in a lead mine, the duty of which is raising 250 gallons of water per min. an elevation of 1,200 ft. The water is brought some distance to the wheel in an underground conduit, and is carried up the masonry tower by pressure, flowing over the top into the buckets.

"This great wheel was constructed some 40 years ago and is said to have been running continuously during all this time. It is the great attraction of the place, hundreds of visitors making the trip to the island every year to see it.

"The illustration referred to affords a very good idea of the progress made since that time in Hydraulic Engineering and is reproduced for the purpose of showing, by way of comparison, the advantages of the modern and now generally accepted method known as the Pelton System of Power.

"The little cut in the upper corner re-

ing the wonderful progress made in engineering practice during the last half century, in bringing the forces of nature into subjection, making them subservient to commercial and industrial purposes."

CORRESPONDENCE

CALIFORNIA.

(From our Special Correspondent.)

BALLARAT, INYO COUNTY, CAL.

April 8, 1898.

EDITOR JOURNAL:—Considering the excitement lately inaugurated here, by the strike made on the Mineral Hill property, this camp has progressed wonderfully. Several deals have recently been consummated.

P. H. Pheby has bought the Burro mine, and intends pushing development work. Ten thousand dollars cash was paid for this property. Mr. Pheby has bought a 10-stamp mill, and is erecting the building for the mill. The boarding houses and other necessary build-

ing the wonderful progress made in engineering practice during the last half century, in bringing the forces of nature into subjection, making them subservient to commercial and industrial purposes."

ing the wonderful progress made in engineering practice during the last half century, in bringing the forces of nature into subjection, making them subservient to commercial and industrial purposes."

ing the wonderful progress made in engineering practice during the last half century, in bringing the forces of nature into subjection, making them subservient to commercial and industrial purposes."

ing the wonderful progress made in engineering practice during the last half century, in bringing the forces of nature into subjection, making them subservient to commercial and industrial purposes."

ing the wonderful progress made in engineering practice during the last half century, in bringing the forces of nature into subjection, making them subservient to commercial and industrial purposes."

ing the wonderful progress made in engineering practice during the last half century, in bringing the forces of nature into subjection, making them subservient to commercial and industrial purposes."



ELECTRIC POWER PLANT, STANDARD MINING COMPANY, BOHNE, CAL.

presents a Pelton Wheel of corresponding capacity under similar conditions of head and water supply being drawn to the same scale.

The extraordinary results obtained from this well-known wheel are due to the peculiar shape of the buckets into which the water is directed from one or more nozzles, so that the full energy due to its head or fall is transferred into the inertia of the wheel. The power represented by the force of the water is thus converted into mechanical movement almost entirely without friction, the buckets simply taking the energy out of the stream and leaving the water inert under the wheel.

"The efficiency of the Laxey wheel—taking resistance into account—it is estimated can not be more than 65 per cent of the theoretical power, while the Pelton will develop fully 20 per cent more, and in size and appearance is a mere toy as compared to the ponderous piece of machinery shown, with its massive column, arches, and stone foundations.

"The most striking contrast, however, will be seen in the matter of cost, which is so much less as to make a comparison almost absurd. While no data is at hand in regard to this, it is apparent that it would be at least as one to fifty in favor of the Pelton.

"Such an object lesson is of value in show-

ing the wonderful progress made in engineering practice during the last half century, in bringing the forces of nature into subjection, making them subservient to commercial and industrial purposes."

ing the wonderful progress made in engineering practice during the last half century, in bringing the forces of nature into subjection, making them subservient to commercial and industrial purposes."

ing the wonderful progress made in engineering practice during the last half century, in bringing the forces of nature into subjection, making them subservient to commercial and industrial purposes."

ing the wonderful progress made in engineering practice during the last half century, in bringing the forces of nature into subjection, making them subservient to commercial and industrial purposes."

ing the wonderful progress made in engineering practice during the last half century, in bringing the forces of nature into subjection, making them subservient to commercial and industrial purposes."

ing the wonderful progress made in engineering practice during the last half century, in bringing the forces of nature into subjection, making them subservient to commercial and industrial purposes."

ing the wonderful progress made in engineering practice during the last half century, in bringing the forces of nature into subjection, making them subservient to commercial and industrial purposes."

COLORADO.

(From our Special Correspondent.)

BOULDER, COLO., March 31, '98.

EDITOR JOURNAL: Gold mining is the most seductive and fascinating industry of this age. Fortunes are made sometimes in a brief season and lost by speculation. In this county men are gone wild over the new camps, and great strikes made in our mines during the past few weeks, and the influx of miners and speculators is something wonderful. Stages, coaches, buggies and private rigs are crowded to excess for the several mining towns, while our new Colorado and Northwestern railroad has all it can carry with the present facilities and power.

Wall street has become the magnet of attraction by the wonderful impetus that has been given to the camp during the past few weeks, resulting from the rich strikes made in the properties owned by the Gold Extraction, Mining and Supply Company. Ore that will run from \$10 to \$20 per pound has been found in quantities, but the great values are contained in mineral that is selected for the smelter, wherein the vein matter is quite large containing considerable stamp-mill stuff. Following these numerous strikes real

estate has increased in value 50 per cent., surveyors are staking off lots on both sides the gulch which are bringing good prices, houses are being built for the accommodation of the miners and business men, lots are being graded and work is going on in every stage of construction, and a more lively camp cannot be found in our State. The boom is upon us because of the superior excellence of the mines in this immediate section, and the grand mineral output. The G. E. M. & S. Co. has built and owns a two-story office, a two story boarding house 25x40, a general store 50x80, well stocked, an assay office with all the modern improvements for good work, commodious stables, a tool or material house, and a pretty club house for the accommodation of the workmen and parties residing in the camp. Periodicals, magazines and daily papers are furnished by the company, and a weekly newspaper is issued, giving the mining news of this county. There is a new 10-stamp mill running regularly on the low grade ore to good advantage, amalgamating and concentrating the stuff that will not pay to ship and treat. A tunnel site has been patented 6000 feet in length, which will cut 110 veins along its trend through the mountain. The tunnel is 8x7 in the clear, well timbered, and furnished with a double track, while a complete blacksmith shop stands at the entrance. An air compressor and drills make 150 feet per month in the tunnel, and as each vein is encountered men are put to work developing it. Experiments are being made in the company's laboratory and assay office on the several classes and grades of mineral composing the veins owned by them, for the purpose of deciding the best process to treat the ores which are here in great abundance. Over \$25,000 net was taken out of the Franklin in a few months by development, and twice that amount could have been mined by stoping. Yesterday President Charles W. Caryl purchased the Concord mine, consideration \$50,000, and will run it to its fullest capacity and make it a constant shipper to the smelting works. This new addition to his other properties will make it one of the strongest and most extensive mining operations in Boulder county.

On Puzzle mountain, Ward mining district are the Ward-Rose and Chief mines, which have lately jumped into prominence and caused a furor in mining circles by the magnificent ore bodies that have been exposed in these properties during the past month. The Rose mine is 160 feet deep, and has paid expenses for sinking and drifting without stopping a fathom of ground. The vein will average $3\frac{1}{2}$ feet thick throughout the workings, the ore is sulphide, carrying values from \$140 to \$200 per ton when selected, while the mill dirt averages from \$15 to \$25 per ton. About 500 tons of the poorer grade lies on the dump for treatment when the new railroad reaches this point, and transportation to Boulder is reduced to \$1 per ton, and treatment for \$2 a ton; then this property will be a bonanza. A fine body of ore was uncovered in the bottom of the shaft on Saturday last, and several tons are ready to ship to the smelter. The mine has a new Corliss engine and hoisting plant, a fine shaft house, and every convenience for extensive mining operations.

The Chief mine is being unwatered, a new engine having been purchased and placed in position for this purpose. The vein is large in this mine, and will be extensively opened in the future. Superintendent Frank W. Davis is very much elated over the outlook

for large production of high grade from these mines during the summer.

The Golden Age mine produced this week three pounds of ore and free gold that is worth \$200 per ton. This ore is sawed into thin slabs for jewelry. Twenty-three pounds brought \$50 per pound, and 66 ounces of retorted gold was sent to the mint, besides 300 pounds of ore that netted \$5 per pound. The regular ore was sent to the sampling works, from which no returns have been received at this writing. This is the best record I have ever heard from any mines in the United States. I will state that the specimens are sold at \$20 per ounce by the leasers who struck this rich pocket of black telluride of gold and pure gold last week. In my article of March 3, on the Golden Age mine, in speaking of the very rich ore, I said: "But it certainly pays to exercise much care when taking out ore that yields \$20 to \$30 per pound" (not ton as stated in your issue of March 15). Our rich telluride ores are always sold by the pound, as it would require a lifetime almost to accumulate a ton of ore that would sell for \$200 per pound or \$400,000 a ton, such as the Sherman Bros. and Dubi mined this week.

WILLIAM M. RULE, M. E.

The Pelton Water Wheel Co. have recently issued a new edition of their catalogue, which embraces a vast amount of tabular and descriptive matter, relating to the means of utilizing water powers by the Pelton system, making quite the most valuable contribution to modern hydraulic literature that is now available.

Much attention is given to the generation of power for electric transmission which is now the absorbing question in electrical science. Upwards of one hundred and forty electric power stations are listed as having been installed by the Pelton Company within the last three years, aggregating some 80,000 horse power wheels, running under heads varying from 40 up to 1700 feet. The system here described makes possible the utilization of this source of energy under a wide range of conditions and with a degree of economy, simplicity and efficiency never before attained.

Engineers, as well as parties interested in the development of water powers, will be furnished a copy upon application to the Pelton Water Wheel Co., 121-123 Main Street, San Francisco, Cal.

A Belt Dressing.

It is the slipping heel that wears the hole in the stocking, and it is the slipping belt that wears the leather. Belts that slip not only do not drive properly, but they wear out rapidly. A thoroughly reliable belt dressing is therefore a necessity in every well regulated factory, and probably no dressing has such a world-wide reputation as Dixon's Belt Dressing and Leather Preservative.

As long ago as 1878, it was used on the big driving belt at the Paris Exposition, when every other means had failed to make the belt take hold of the pulley that was to start the thousands of feet of shafting and hundreds of machines. Those who use Dixon's belt dressing claim that it prevents slipping and thoroughly preserves the life and elasticity of the belt. It is made only by the Joseph Dixon Crucible Company, Jersey City, N. J., who are known the world over for their graphite products.

GOLD MINING IN THE BLACK HILLS.

BY PROF. H. D. NORMAN,
Of the Dakota School of Mines, Rapid City, Dakota.

(Continued from our issue of Feb. 1st, 15th, Mar. 1st and 15th.)
Subjects treated upon in preceding issues are as follows:

I. THE ORES.

Character of the Ores.
Sorting of the Ore.

II. ENUMERATION OF MILLS.

III. OUTLINE OF PLANT AND PROCESS.

IV. GENERAL FEATURES OF THE MILLS.

Distribution of Power.
Supply of Water and Fuel.
Auxiliary Arrangements.

V. THE MILLS IN DETAIL.

Grizzlies.
Rock Breakers.
Ore Bins.
Feeders.
Battery Foundations, Frames and Guides.
Battery Frames.
Guides.
Mortars.
Dies.
Screens.
Stamps.
Cams and Cam-Shafts.

Crushing-Capacity.—The crushing capacity of a battery depends on the efficiency of the stamp (that is, the number of foot-pounds developed), the character of the rock under treatment and the discharging capacity of the mortar (that is, the height and size of mortar at the discharge, the character of the screen and the width of the mortar at the discharge). The Homestake stamp weighs 850 lbs. and drops 9 in. 85 times per minute, thus it develops 78,030,000 foot-pounds in twenty-four hours, crushing $4\frac{1}{2}$ tons of rock, or one ton for every 17,340,000 foot pounds developed. The Caledonia stamp weighs 850 lbs. and drops 12 in. 74 times per minute, developing 90,576,000 foot-pounds in twenty-four hours, crushing 3.3 tons of rock, or one ton for every 27,447,272 foot-pounds developed. Thus, although the efficiency of the Caledonia stamp is greater than that of the Homestake, it crushes less ore. There are several reasons for this. First, the character of the rock, which is much harder than that at the Homestake; second, the width of the mortar at the discharge (16 in. against 13 $\frac{1}{2}$ in.); third, the 2 in. recess for the 8 in. amalgamated copper-plate below the feed, which is absent in the Homestake mortar. From the lower discharge of the Caledonia mortar (6 in. against 10 in.), a greater crushing capacity would naturally be expected than from the Homestake mortar. The above reasons will explain why this falls. The smallness of the Caledonia screen (258 sq. in. against 376 sq. in.) may be assumed to be counterbalanced by its character (Caledonia No. 24 wire against Homestake No. 7 slot, which corresponds to No. 30 wire). The Caledonia Co. claims that more gold is recovered by its slow method than by the more rapid one of the Homestake. This point could only be definitely settled by exact tests.

Apron-Plates.—In order to save the fine particles of gold that have not been caught on the inside copper plates and to collect any amalgam and quick-silver that have passed through the screens, an amalgamated copper-plate, the apron-plate, is placed in front of the

mortar. The motion of the battery water, caused by the dropping of the stamps, throws with the drop of each stamp some pulp against and through the screen. This, passing over the lip of the mortar, flows in small waves over the apron-plate. During the slight interval between these waves any heavy particles of the pulp (quicksilver, amalgam or fine gold) passing over the amalgamated plate have a chance to settle upon, adhere to and combine with it. The plate consists of one sheet of copper nearly as wide as the discharge of the mortar, fastened with iron screws to the inclined wooden table beneath it. In all the Homestake mills (except the Deadwood and Golden Terra, where it is 12 feet long) the copper plate, 3-16 in. thick, is 10 ft. long, falls 2 in. to the foot, and discharges into a copper-lined trough, leading to the mercury-trap. The apron-plates of the Caledonia are 8 ft. long $4\frac{1}{2}$ feet wide, and the copper is $\frac{1}{4}$ in. thick. They have the same fall. The wooden table extends 4 feet beyond the end of the copper plate, at the same time narrowing to a width of 4 feet. It has a 1 in. rib down the center and is overlaid with two blankets, 5 ft. wide and 22 in. long, the upper overlapping the lower. On these the heavy sands collect. Each is washed every half hour in a tank. These blankets last six months. Carpets were tried, but they frayed and had to be thrown out after one month. The pulp from the blankets flows into the mercury-traps, one being placed in the middle of the discharge for every plate.

The plates are of Lake copper, furnished to the mills ready for use, and do not require any annealing to make them porous. They have, however, to be flattened with wooden mallets to make them lie smoothly on the wooden table and to remove any inequalities produced during transportation. At the Homestake mills they are first scoured with sandpaper, followed by emery cloth or with tailings and a wooden block 4 in. square, or with a grindstone, until the face is perfectly bright. If necessary, the sand is moistened with a weak solution of potassium cyanide, and spots are often removed with dilute nitric acid. The surface of the pure metallic copper receives a solid coat of potassium cyanide, which is applied repeatedly as a strong solution by means of a soft paint brush. After two days the mercury is sprinkled on this cyanide coat and rubbed into the plate with a moist cloth and tailings. When the plate is thoroughly amalgamated, it is put into place and is ready for use. More than the usual amount of mercury is added to the mortar, that the new plate may become normal. This takes from two to four weeks, during which time the plates are continually discolored by copper salts. To get these into solution, potassium cyanide or ammonia is added to the battery-water. At the Caledonia mill the procedure is similar, only more care is taken to saturate the plate with mercury before it is put into use. Only the ordinary quantity of quicksilver is then added to the mortar with a new plate. In none of the mills are the plates coated with amalgam before they are put to use, nor are there any silver-plated copper plates used in the district.

The Mercury-Traps through which the pulp passes on leaving the apron-plates, save amalgam and quicksilver not collected on the apron-plates. There are additional traps at the termini of the sluice-plates outside. At the Homestake mills the pulp formerly flowed from the apron-plates directly over the sluice-plates into the waste flume. Then the traps were introduced. How important this single

contrivance is, can be seen from the fact that in the Homestake 80-stamp mill there are recovered every month, by the inside traps, 80 oz. of amalgam and 144 of quicksilver; by the outside traps, from 10 to 12 oz. of amalgam and 40 of quicksilver. These traps are emptied only once a month. If they were emptied twice a month on clean-up days, a still better showing could perhaps be made. At the Caledonia, the traps are emptied daily, when the apron-plates are being dressed; this is done because of the accumulation of concentrates.

At the Homestake mills, the inside trap consists of a wooden box, with copper-lined bottom, 14 in. long, 17 in. wide and 24 in. deep. It contains three sliding wrought-iron plates, parallel with its short sides. These are placed $2\frac{1}{4}$ in. apart, the center one extending to the bottom of the box, the others to 3 in. above it. The pulp flows under the first, over the middle one, and again under the third. The outside trap is larger. The wooden box is 48 in. long, 14 in. wide and 48 in. deep. It has three partitions, set $10\frac{1}{2}$ in. apart, reaching from the bottom of the box up to $1\frac{1}{2}$, 3 and 4 in. below the level of the inlet, the outlet being 6 in. below this. In the middle, between two wooden partitions, is let down a sliding wrought-iron plate, $\frac{3}{4}$ in. thick, reaching to 3 in. from the bottom of the box. The Caledonia traps are much smaller, since there is one for each apron-plate.

The Sluice-Boxes, receiving the pulp from the inside traps, are simply wooden troughs with copper-lined bottoms. At the Homestake mills they are from 8 to 10 feet long, 18 in. broad, and have a fall of 1 in. to the foot. The copper used is $\frac{1}{8}$ in. thick. At the Caledonia mill they are 8 ft. long and only 8 in. broad, as less pulp passes through them. The main sluice into which they discharge is 2 ft. square.

VI. LABOR IN THE MILLS.

All the heads in the different departments are responsible to the superintendent. The mill proper is in charge of a foreman, thoroughly acquainted with every detail of work. One foreman often has the general charge of several mills, as with the Homestake and Deadwood Terra companies. Next comes the millwright, who sometimes has, as in the Homestake mill, an assistant called the pipe-fitter. The millwright combines the trades of carpenter and machinist. His duty is to make the guides, put them in place and keep them in order; to exchange cams and camshafts, fasten any cams that have become loose, make and replace screens, make and repair chuck-blocks, to reverse and exchange shoes and dies of crushers and to look after all the piping in the mill; in one word to erect and keep in order every part of the mill for which any mechanical knowledge is required. One of his duties, for example, consists in lining all the shafts and in babbiting their boxes.

In this connection might be mentioned a method of lining shafts, which originated with Mr. R. Graham, the millwright of the Homestake Company, and which has proved to be quick and effective. When a shaft is to be lined, the boxes are placed so as to be approximately in line. The lower bearing, which is to receive the shaft, is loosely packed with clay and a wooden center pressed into it. This consists of a semi-cylindrical piece of dry wood having the same diameter as the shaft and about the length of the box. The wooden centers of two or more boxes are now care-

fully lined and the clay packed tightly around them. When in line the centers are removed, one after another and the clay cut out crosswise in the middle of each box. The center is then replaced and the hollow space filled by pouring in babbitt. The center and remaining clay are then removed and upon the ribs of babbitt (in the middle of each box) is placed the shaft, which is now accurately in line. Finally the space left is filled with babbitt. In this way the shaft can be quickly and accurately lined, the bearings will be absolutely true and the lining from $\frac{1}{4}$ to $\frac{3}{4}$ inch thicker than the ordinary $\frac{1}{4}$ inch lining; consequently the shaft itself will last longer.

After the millwright comes the machinist. The Homestake Company having a large shop, all repairs are made there. At the Caledonia mill the foreman is also machinist, and any extensive repairs are made by the Homestake Company.

As the mills are driven by steam, each one has two engine-men, who are responsible for their firemen. To guard against fire or any other accident, there is generally a night watchman for every mill. These men are directly responsible to the foreman.

Miscellaneous Mining News.

ALASKA.

A most terrible disaster has overtaken nearly one hundred souls, who were rushing to the Klondike to seek their fortunes in the frozen ground of that God forsaken land. On April 3rd, an avalanche of snow descended Chilcoot pass, taking everything in its path, and as details are received, the horror is increased instead of lessened.

The names of one hundred and fifty missing have been reported as unaccounted for, though it is barely possible that some of these succeeded in crossing the pass before the avalanche occurred.

A fact that lends horror to the fearful tragedy is that it may never be known with any degree of accuracy just how many lives were sacrificed, who they were or where they came from.

Many a poor fellow lies buried where no human aid can reach him, and where his remains must rest until the summer sun melts the tons of snow and ice under which he lies buried. Upon the crowded trail no record was kept of the living, toiling mass, braving hardships and facing death in the mad rush for gold. *Transit in exemplum.*

ARIZONA.

The Tennessee ore shoot is growing larger as work progresses, and it is now of large size and good grade.

Several more leasers have gone to work on the Nighthawk. They will put up a gasoline engine and pump and work below the lower tunnel.

Tom Johnson's mine at Chloride continues to produce solid ore, and is now among the paying properties. Their shaft is down nearly 100 feet.

O. F. Kuencer will start up the Esmeralda Mine as soon as the preliminaries can be done. Charles Richards will have charge of the mine. The Esmeralda has a steam hoist on it, and the main shaft will be sunk deeper and levels run.—*Mineral Wealth.*

George Young and Mr. Simpson have commenced the erection of a concentrating plant

at Dos Cabezas, Cochise county, to work some placer ground that will average \$10 per ton.

The drift in the lower workings of the Gladiator, near Prescott, Arizona, is now in between 90 and 100 feet, and is still in the high grade body of sulphide ore encountered a short distance from the shaft. This ore body gets stronger the further they have penetrated it. The mill is running day and night and there are about 40 men employed at present at the mine.

J. C. Underwood, who had an interest in some mines at Kirkland, Arizona, has disposed of his interest to the Springfield Mining Company of that place. The properties which Mr. Underwood owns an interest in are some of the best to be found in Arizona, and the purchasers are well pleased with their bargain. With some development these mines will be made producers of the finest. Mr. Underwood still has some properties in the district, which he will prospect and develop in the near future.

CALIFORNIA.

KERN COUNTY.

N. D. Burlingham has returned from the mines in the Sugland district, near Pah Ute mountains in Kern County. The five-stamp mill is completed and in operation, crushing from eight to ten tons of \$12 ore daily. Concentrators will be added shortly. The Golden Crescent Mining Company owns the properties in which Mr. Burlingham is the chief stockholder.

There is a great deal of activity in the mines around Randsburg just at present, and many of them are turning out big profits. About fifty tons of Kinyon ore have just been run through the mill. The output was \$6500. Selected small amounts of ore from the Maganetta run \$200 to the ton. The Little Butte is said to have a quantity of \$45 ore at the bottom of its shaft.

From Johannesburg word comes that several mines are yielding \$20 ore.

SAN BERNARDINO COUNTY.

The Colorado Iron Works Company, of Denver, Colo., made another shipment of three carloads of machinery for the Randsburg Santa Fe Reduction Co., at Barstow, California. Up to date eight carloads have been shipped for this new mill now being erected at the above place.

Cortelyou & Giffin are interested in a splendid copper mining property in San Bernardino County, which Mr. Giffin has lately expected. The claim is being developed, and it is said will be placed upon the market.

The large ore bodies of the Blackhawk mines, probably the largest in that section, have good prospects of being worked again to advantage. J. B. Cook has sold out his interest in the mines, and there is prospect of sufficient capital taking hold to run the mines as they should be, and if so the result will be very remunerative.

SAN DIEGO COUNTY.

In the Vallecitos, "Peachland," numerous prospectors are busy attempting to locate paying claims. John E. McIver has unearthed tin ore on his place very similar to the Temescal ore, and in all probability has

struck a good thing. His brother, D. B. McIver has some fine looking specimens of gold ore, identical with the Cripple Creek product, and which has assayed very high. Mr. McIver now thinks he has discovered the main ledge. M. E. Bidwell and Clark and McIlhane also hold some promising prospects.

J. Farnsworth, of the North Star Mine, San Diego County, in connection with other parties, is erecting a five-stamp mill on the mine. The several hundred tons of ore worked at the Banner Mine will average over \$30 per ton.

C. F. Holland, of the Elevada Mine, has a force of men reopening the property. A recent run of about 100 tons yielded \$9,000.

SHASTA COUNTY.

A ten-stamp mill is to be erected at once by the San Francisco owners of the old Spanish claim in the Lower Springs, Shasta County, mining district. The machinery is being moved on the premises now.

COLORADO.

The output of the Cripple Creek camp for the month of February, the shortest month in the year, is encouraging, to say the least. The stamp mills of the district were practically idle during the month. Summarized, the output is as follows:

	Tons.	Average.	Tot. Val.
Smelters	10,000	\$60.00	\$ 600,000
Reduction Works	23,730	24.70	586,600
Grand total....	33,740	\$1,186,600

The Mic-Mac Company filed articles of incorporation last week, at Georgetown, Clear Creek County. Development work has been going on at the mine for some time, thirteen men being employed. The shaft is down 220 feet, and shows an 8-inch vein of $3\frac{1}{2}$ ounce ore. The drifts which are being driven ahead, are also in ore.

The lessees of the Gold Dust in Illinois Gulch, Summit County, have completed timbering the tunnel, and are again in good free milling ore. The last lot treated from this lease ran over five ounces in gold per ton.

The Sedalia Mine, at Leadville, is shipping sixty tons daily of gold ore to the Arkansas Valley sampler. Besides this, much expensive development is under way. Superintendent Terrence Connors has charge of the mine.

The Pawnolis Mine, on the north side of the Evans Gulch, near Leadville, is employing eighteen men on development work. This enterprise, if successful, will open an entirely new territory. Messrs. McGeorge and Emerson are largely interested in the proposition.

IDAHO.

The Bedrock Dredging Company has 250 acres of ground in Boyle's and California Gulches and Wolf and Granite Creeks. The property is so located that it cannot be worked by old methods. The company will put in a bucket dredge, the machinery is to arrive at Boise in about a month.

MINNESOTA.

The first vessels for ore arrived at Two Harbors March 24th. This is the first year on record in which vessels got in before April 20th. Ore trains were put on March 28th, and there are vessels in port to load 20,000 tons. This ore is all from No. 4 stockpile of

the Chandler, whence early shipments were necessary. Ore will not be going to docks at Duluth for two weeks yet. The extension there of No. 2 dock for the Duluth, Missabe and Northern road is about completed, and 400 ore cars for the Missabe road, built at Pullman, are expected to be ready in a month.

The explorations at the Southall Iron Company's Mine may be stopped, as a result of troubles into which Mr. Southall has fallen in connection with the government engineer's office at St. Paul.

MISSOURI.

The Albatross Mine, two miles north of Alta, now has in operation two large steam pumps, two steam end pumps, one Hooker pump and two double-action force pumps, the whole having a capacity of 360,000 gallons per hour, the largest and most complete plant in Southwest Missouri. The mill can handle 100 tons a day. The shafts are down 215 feet, with good blende below 146 feet and plenty of mineral in the bottom of each shaft. Capt. S. O. Hemenway is the manager; Frank Reily superintendent.

MONTANA.

The leasers who are working on the Broadway at Iron Rod have 50 tons of ore ready for shipment.

The Twilight Mining Company at Iron Rod received returns from 13 tons of ore taken from that mine recently.

Mr. Holmes, who bonded the B. & L. mine at Washington Bar last fall, has four men at work driving a tunnel on the vein, and no doubt will develop a good paying mine.

Mr. Westbrook, of Castle, says he is still taking ore out of the Stewart Mine. He will commence to ship ore again just as soon as the roads get in a condition for either sleighing or wheeling.

An additional force has been put on at the Snowshoe Mine, which will hereafter be run to its fullest capacity. Its output will be greatly increased next season.—*Western Mining World*.

The Colorado Iron Works Co. are building a set of 54"x8" high speed, narrow face rolls for the Anaconda Copper Co., Anaconda, Mont.

NEVADA.

The 40-stamp mill concentrating plant, built by the Colorado Iron Works Company, for the Dexter Mining Company, at Tuscarora, Nevada, began operation on February 3rd. This mill is an up to date one in every respect, the ore being handled automatically from the time it is mined until it reaches the tailings pond at the cyanide plant.

Prospectors will soon commence the work of searching for gold mines in Ellsworth and Marble Falls districts, Nye County. It has been known for several years that gold exists in the districts named, but it is claimed that for lack of funds the prospectors were compelled to cease their explorations.

It is rumored that the gold mines in Montgomery district, Nye County, have been sold to a wealthy company. Should the rumor prove well founded, that mining district will be one of the liveliest and most prosperous districts in Nevada.

NEW MEXICO.

A short time ago the estate of the late Senator George Hearst purchased the plant of the Silver City Reduction Company, and its future manager will be D. B. Gillette, jr., well and favorably known. The new management is now treating 200 tons of ore daily, and it is the intention to considerably increase the capacity of the plant and equip it with all modern appliances for the successful and cheap treatment of ores and concentrates.

Output of Hillsboro gold mines for the week ending Thursday, March 17th, 1898, as reported for *The Advocate*:

	Tons
Wicks.....	20
K. K.	10
Richmond..	40
Happy Jack.....	10
Snake Group.....	65
Opportunity.....	15
Sherman	5
Prosper.....	5
Eighty-five.....	5
Rex (silver-lead).....	5

Total 180

Total output since Jan. 1, 1898.—2,210.

OREGON.

Messrs. Stevens and Calvert, who have lately opened up a rich channel on Pleasant Creek—one that is believed to be the original bed of the stream—brought in a nice little clean-up this week, says the *Oregon Mining Journal*, at Grant's Pass. It consisted of \$330 worth of gold, including one nugget worth \$50.

The Ball Mine, located on Eddy's Gulch, near the old Klamath Mine, is being operated by the Ohio Mine and Milling Company, under the supervision of L. D. Ball, of Ohio, who is meeting with very good results. He has recently run a tunnel about 35 feet from the main tunnel, and struck a very rich ledge of ore. He had just finished milling 95 tons of ore which paid him \$18 a ton.

SOUTH DAKOTA.

Homestake Mining Company has paid its 239th dividend of 25c. per share (31,250). Settlement was made March 25, by the transfer agents, Lounsbery & Co., in New York City. Including this dividend, there has been paid out \$6,650,000 to date.

Wasp Number 2: A large shoot of ore has been uncovered on this property in the Yellow Creek district. The ore lies on quartz, and has an average value of \$45. Vein is 50 feet wide and five feet thick.

Golden Hill: The steam hoisting works have been started up at this mine. The shaft is 90 feet deep. The Squaw Creek Mining Company has commenced working its ground in the Squaw Creek district.

UTAH.

Although the company had sufficient money in its treasury, the Bullion Beck directors did not declare a dividend, but the indications are that payments will commence next month.

The mill of the Chloride Point Co. is still lying idle, and the ore shipments to the smelters seem to be less frequent.

The Dalton will probably levy an assessment of $\frac{1}{2}$ cent a share in a few days.

Geyser-Marion mines are in splendid condition, and it is expected dividends will soon be declared. The stock is now in stronger hands than ever.

The increase in the Geyser mill capacity is being rushed ahead and that plant will have been closed down for a time.

Arrangements are again being made to increase the mill capacity of the Mercur Mine. The mines are making a magnificent showing.

The pipe line to the mill of the Northern Light, which has been frozen for some time, will soon be reopened and operation resumed.

WASHINGTON.

The following meetings of stockholders of mining companies are advertised to be held in Spokane, Washington:

The third meeting of the stockholders of Helen E. Mining Company took place on April 4th.

The annual meeting of the Crystal Butte Gold M. and M. Co. will be held on April 18th.

The annual meeting of the Tom Thumb Gold M. and M. Co. was held on the 25th of March.

FOREIGN MINING NEWS

BRITISH COLUMBIA.

Supplies are being rawhided to the well-known Slocan mine—The Noble Five, which is expected under its new controlling owners again to prove a large shipper and goodly profit earner, after a period of temporary financial collapse, due to lack of capable administration. More substantial moneyed men are now understood to be behind The Noble Five.

The Velvet, a Rossland mine has now shipped 400 tons of ore, all got out in the course of development. The owners regard this as an encouraging omen, since The Velvet has now, although a very young mine, shipped almost as much ore since the beginning of the year as the War Eagle or the Iron Mask. The War Eagle will, however, again become a very big shipper almost immediately.—*British Columbia Mining Critic*.

The Blue Bell group of five claims, near Illecilliwaet, has been bonded by Mr. I. G. Syme, on behalf of a London syndicate. A considerable amount of development work has already been done on this property, which is regarded as one of the most promising in the district.

MEXICO.

Chihuahua.

The building of the Parral branch of the Mexican Central, as also of the Chihuahua Pacific Railway is causing unusual activity in the mining districts opened up by these lines. As one of the most serious drawbacks heretofore experienced has been the lack of quick communication to these extensive mineralized regions. The new concentrating and smelting plant in course of construction at Juarez will also farther assist in the development of the mineral resources of this state.

Mexico.

Rasmus Hanson, a well known Colorado

mining man, has taken an option on some of the extensions of the Esperanza property, which he is going to develop. There is unusual activity all over this state, the investors being generally substantial men. Jesse Grant is now at his property in the lower part of this state.

Sonora.

In the Creston mine the large body of rich ore recently encountered by a crosscut has proven to be a continuous vein parallel to the old lode. As the ore is high grade the discovery is very valuable, and will make this property a property a bonanza.

LOWER CALIFORNIA.

The Lacy Brothers of Los Angeles have what is known as the Barenos mines, at San Francisquito, on the Gulf side of Lower California. Recently, while drifting from the twenty-five foot level, they struck an eleven-foot vein of remarkably rich ore.

Thirty men are employed at the property at the present time—this force will be increased in the near future.

PERSONAL NEWS ITEMS

CHARLES O. RICHARDSON, mining engineer, of Pueblo, Colo., is at present in Chicago.

CHAS. BUTTERS sailed hence from South Africa on the 8th ult, and is expected here this month.

D. KEITH, managing owner of the Silver King mine at Park City, has taken a trip into Mexico.

T. J. PARSONS, Vice-Pres. California Miners' Association has returned to San Francisco from Nevada City, Cal.

HENRY F. HOYT of St. Paul has been in Joplin, Mo., examining the property of the Hermit Mining Company, in which he is interested.

F. E. GOODHEART of London, England, will arrive in Utah shortly to visit the Mammoth mine, of which he is one of the heaviest share-holders.

PERCY WILLIAMS of Silverton, Colo., has been appointed agent for the Philadelphia Smelting and Refining Company in the North-west, with headquarters at Northport, Wash.

The Monitor Tunnel Company of Butte was incorporated at Helena, by JOSEPH H. MORONG of Chicago, and THOMAS T. BAKER and WILLIAM S. SWITZER of Butte, Capital \$300,000.

GEO. E. AMES, for many years agent of the Union Iron Works, and one of the oldest and best known mining engineers in the United States has accepted the position of consulting engineer of the Anaconda, Montana, Copper Co., and left this week for his new home.

MELLVILLE ATTWOOD, the veteran mining engineer and assayer, is reported in his last illness at his residence in Oakland, Cal. Mr. Attwood made the first assay of Comstock ores in '59, and for over sixty years has been identified with mining and metallurgical interests in Europe and America.

Among the prominent mining men in the city during the past week we note the following, says the Butte, Montana, *World*: L. C. PARKER, Garnet; E. J. HOLLAND, Philipsburg; COL. W. F. SANDERS, Helena; M. C. GRAY, Ruby mine; B. F. HOLLANDER, Denver; R. P. WHIPPLE, Diamond Hill; R. C. DUNCAN, Pony.

A. E. SALVIN, general manager of the Grangesberg mines at Grangesberg, Sweden, and CLARS LANDEN, civil engineer of the same corporation, have been at the principal iron mines of the Menominee range in Northern Michigan, the Calumet & Hecla copper mine, and the Mesabi iron range in Northern Minnesota.

GEORGE SIMMONS, the discoverer and present owner of the True Blue Turquoise Mines in Southern Nevada was one of the callers at the JOURNAL. Mr. Simmons is now in possession of the largest cut Turquoise in the world, the weight of which is one hundred and forty-seven karats and is the most perfect gem now extant. Some of the specimen shown the JOURNAL were the most beautiful ever examined. Gems from the True Blue Turquoise Mines are absolutely guaranteed to retain their color.

THE MARKETS.

New York, Apr. 12th, 1898

The following are the Silver, Copper and Lead quotations for the last two weeks.

	SILVER	COPPER	LEAD
Mar. 28	11 1/2	11 1/2	11 1/2
" 29	11 1/2	11 1/2	11 1/2
" 30	11 1/2	11 1/2	11 1/2
Apr. 1	11 1/2	11 1/2	11 1/2
" 2	11 1/2	11 1/2	11 1/2
" 3	11 1/2	11 1/2	11 1/2
" 4	11 1/2	11 1/2	11 1/2
" 5	11 1/2	11 1/2	11 1/2
" 6	11 1/2	11 1/2	11 1/2
" 7	11 1/2	11 1/2	11 1/2
" 8	11 1/2	11 1/2	11 1/2
" 9	11 1/2	11 1/2	11 1/2
" 10	11 1/2	11 1/2	11 1/2
" 11	11 1/2	11 1/2	11 1/2
" 12	11 1/2	11 1/2	11 1/2

It is hardly worth changing quotations in silver market as the prices remain about the same. There are very few sellers in the market, and those only with small quantities.

The demand is also very unsteady. The United States Assay Office in New York reports the total receipts of silver at 147,000 oz. for the two weeks ending April 9th.

COPPER.

While the tendency remains very strong and no cheap copper is obtainable very little business has been done, on account of the political uncertainty hanging over the country. Such business as has been done was at full figures, but naturally buyers are rather hesitant in times like the present. Lake copper remains as scarce as previously reported; there does not appear to be any sellers at 12c., but as yet no sales are reported at higher prices. Electrolytic copper has

been somewhat neglected, and most still is quoted 11 1/2c. for cakes, wirebars or ingots, and 11 1/2c. for cathodes. Casting copper is nominal at 11 1/2c.

LEAD

Lead has been very dull, and not much progress has been made in any direction. Buyers hope to do better by waiting somewhat, while producers look for rather higher prices and are holding firm. The price in New York has still to be quoted 3.50c.

SPELTER

Spelter continues in excellent demand, and most producers are sold out for March and April delivery. Business has been done at \$4.25 @ \$4.30c., New York, and \$4.02 @ \$4.07 c., St. Louis.

ANTIMONY.

No change of any note has occurred. Quotations for Cookson's 8 1/2c.; Hallett's 7 3/4c.; Japanese 7 3/4c. and U. S. Star 7 3/4c.

NICKEL.

Business still continues on unchanged lines and no alteration in prices can be reported. We quote for New York ton lots 33 1/2c. and 36c. per lb. and for smaller orders 35 1/2c. and 38c.

TIN

There has been a very large consumptive demand, both for spot and forward delivery, and had it not been for the higher prices asked, a very large business would have been done. We quote for spot 14.32 1/2, and futures \$14.45.

PLATINUM

Prices are now quoted at \$15 and \$16 per oz., New York. The London quota-

tions are 58 @ 60 s per oz. Supplies are not large and prices are firm. For chemicals, best hammered metal, Messrs. Eimer & Amend of New York furnish the following quotations: In lots of 250 grams or more, 56c. per gram; in lots of 100 grms or more, 57c. per gram; less than 100 grams, 58c. per gram; unmanufactured platinum will be supplied in same quantities at 2c. less per gram.

QUICKSILVER.

The New York quotation is at \$39.50 per flask. San Francisco quotations are \$40 for domestic consumption.

POWDER.

The market at San Francisco is fine with the current quotations. The quotations are as follows: For Hercules No. 1, from 11 1/4c. to 17 1/4c., according to strength and quantity. No. 2, from 9c. to 11c., according to strength and quantity.

COPR.

The market at San Francisco, Cal., is quoted as follows: English, spot, in bulk, \$11.00; in sacks, 12.00; Cumberland, 10.00.

BORAX.

The San Francisco market in Borax is firm with a good demand. The market is quoted as follows: Refined, in carload lots, in barrels, 7.00; Refined, in carload lots in sacks, 7.00; Powdered, in car lots, 7.00; Concentrated, in car lots, 6.00.

THE MINOR METALS.

Quotations are given below for New York delivery:

Aluminum: No. 1, 98 per cent. ingots, per lb., 14 1/2c.; No. 2, 90, 14c.; Rolled sheets, per lb., 14c.; Alum.—Nick., 14c.; Blamuth, per lb., 14c.; Phosphorus, per lb., 14c.; Tungsten, per lb., 14c.; Tungstic acid, 14c.; Ferro-tungsten, 60 per cent., 14c.

Variations in price depend chiefly on the size of the order.

CHEMICALS.

The chemical market is rather uncertain and prices have declined somewhat. Receipts of domestic goods are enlarging in volume and thereby causing reduction to be made in quotations.

Quotations generally are as follows:

CAUSTIC SODA.

Quotations for Caustic soda domestic high test are \$1.50 @ 1.55 per hundred lbs.

ALKALI.

Domestic, 58 percent., 50c. @ 55c., foreign 45c. @ 50c. from dock as to style of package.

CARBONATED SODA ASH.

58 per cent., 90c. and 95c. per 100 lbs. basis +8 per cent.

BI-CARBONATE OF SODA.

English, \$1.75 and \$2.12 1/2 per 100 lb. American, bulk \$1.25 and \$1.50 per 100 lbs. according to brand.

SAL-SODA.

For domestic, 50c. per 100 lb., less usual discounts; English, 62 1/2c. and 65c. Concentrated sal-soda, \$1.35 and \$1.60 per 100 lbs.

CHLORATE OF POTASH.

Chlorate of potash is quoted at \$8.50 and \$8.75 per 100 lbs.

LEHIGH UNIVERSITY

South Bethlehem, Pa.

THOMAS MESSINGER DROWN, LL.D., Pres.

Courses in Civil, Mechanical, Electrical and Mining Engineering, Metallurgy and Chemistry. Also Classical and Literary Courses. For further information, and for Registers, address, The Secretary of Lehigh University, South Bethlehem, Pa.

SAVE MONEY! FUEL COSTS MONEY



Protect your pipes and boilers with Wm. Berkfeld's Fossil meal composition, packed in sacks, easy to transport anywhere. Send for facts and figures. FOSIL MEAL CO., 2 Cedar Street, New York

Wm. T. SMITH

"Phone Brown 313"

JAMES IRVING

SMITH & IRVING,

(FORMERLY, W. T. SMITH & CO.)

Gold Refiners and Assayers.

Our silver amalgam for replating copper plates is being extensively used by millmen. It avoids the necessity of sending plates long distances to be replated. For sale in small quantities, 50c per ounce, a reduction being made on all orders over 20 ounces. Experience proves our silver amalgam will catch more gold than when the copper is electroplated. Our Mr. Smith owned and operated Smelting, Refining and Chemical works in Providence, R. I., for over 20 years.

128 N. Main Street Los Angeles, Cal.

MENTION THE JOURNAL

TELEPHONE 562

BELTING

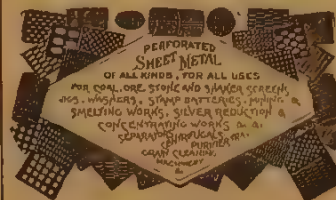
Leather, * Cotton, Rawhide, etc.

ALSO — Lace Leather

L. P. DEGEN, Manuf'r

Agent for Rubber Belting, Hose and Packing.

105 and 107 Mission Street, San Francisco, Cal.



PERFORATED SCREENS

Steel Plate, Copper and Bronze

For all uses. Send for Catalogue

A. J. BECKLEY & CO.

Works Garwood, N. J.

Hoskins' Patent Hydro-Carbon

Blow-Pipe and Assay Furnaces

No dust. No ashes. Cheap, effective, economical, portable and automatic. Send for Price-list to

Wm. HOSKINS,

81 South Clark St., Room 57 CHICAGO, ILL.

J. B. JARDINE

HAS THE FOLLOWING

FOR SALE: Second-Hand 10 Stamp Mill Complete. Second-Hand 14-24 inch Corliss Engine.

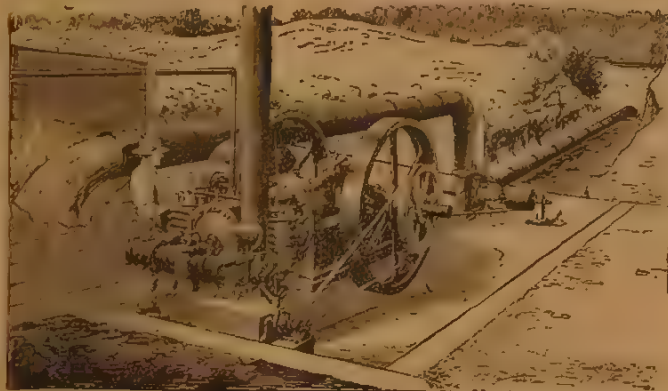
311 Folsom Street, San Francisco, Cal.

Chas. P. Grimwood,

Mining Engineer AND Metallurgist

Laboratory, 214, Pine Street

SAN FRANCISCO, CAL.



LARGEST GASOLINE PUMPING PLANT IN THE WORLD

The illustration shows the gigantic pumping plant recently built by the Hercules Gas Engine Works in the Packer Ranch, Colusa Co. 80 h. p. Hercules Engine, pumping 7200 gallons a minute, 27 feet high. Burns Gasoline or Distillate oil. Cheapest power known. Gas, Gasoline and Oil Engines, 2 to 400 h. p. Send for Catalogue. HERCULES GAS ENGINE WORKS, 210 Bay St., San Francisco.

Acids.

Consumptive demand is satisfied by the deliveries booked orders; otherwise business is dormant. Prices are pretty steady.

Prices are per 100 lbs. in New York and vicinity in lots of 50 carboys or over. Quotations are as follows: Acetic acid, commercial No. 8 \$1.40 @ \$1.55; redistilled, 28 per cent., \$2.00 @ \$2.15; Muriatic acid, 18 per cent., 1.00 @ \$1.37½; 20° \$1.10 @ 1.50; 22° \$1½ @ \$2. according to make and quantity. Nitric acid, 36°, \$3½ @ \$4½; 38°, \$3.50 @ \$4.40; 40° \$3.75 @ \$4.67½; 42°, \$1¼ @ \$5.00. Oxalic acid, \$6.50 @ \$7.00. Mixed acids, according to mixture. Sulphuric acid, 66 per cent., \$1.00 @ \$1.65. Chamber acid, 50° \$6.50 @ \$7.50 per ton at factory. Blue Vitriol, \$3.25 @ \$3.50 according to grade and order.

BRIMSTONE.

Demand continues moderate. No arrivals are noted, and prices are about as last quoted. Best unmixed seconds, \$22.50 for spot, and \$22 to arrive, while thirds are \$21 @ \$22.50 per ton, respectively.

MURIATE OF POTASH.

We quote New York and Boston, 1.75 @ \$1.78; Philadelphia and Norfolk, 1.70 @ \$1.79½; Charleston, Savannah, Wilmington and New Orleans, for 80 @ \$5 per cent, basis of 80 per cent., \$1.00 @ \$1.03½. In lots of 50 tons and upward.

KALINE.

Invoice weights as taken at port of shipment per ton of 2,240 lbs. testing 12.4 per cent. actual potash, equivalent to 23 per cent. sulphate of potash, \$8.80 @ \$9.15 @ \$9.30.

NITRATE OF SODA.

No change in demand, freights are high from the coast and market quotations are \$1.77½ for spot, \$1.75 for next arrival, and \$1.55 for futures.

FINANCIAL NOTES.

The statement of the United States Treasury, on Thursday, April 7th, shows balances in excess of outstanding certificates as below, comparison being made with the statement for the corresponding date last week.

	Mar. 31.	April 7.	Changes.
Gold.....	\$171,867,761	\$176,688,905	1. \$4,821,144
Silver.....	10,739,095	7,313,428	D. 3,425,667
Legal Tenders	39,361,027	37,454,711	D. 1,906,316
Treasury Notes,			
etc.....	4,071,172	3,571,734	D. 499,438
Totals.....	\$226,039,055	\$223,028,179	D. 3,010,876

Treasury deposits with national banks amounted to \$31,643,782, an increase of \$362,500 during the week.

Gold and Silver Exports and Imports.

At all United States ports, February, 1898, and years from January 1st, 1898 and 1897.

	Cons and Imp.	Exp.	Imp.
Gold.....			
Feb.....	\$981,369	\$4,130,109	\$222,183
1898.....	1,144,606	1,351,155	206,549
1897.....	769,644	1,001,321	231,677
Silver.....			
Feb.....	3,753,331	372,034	6,720
1898.....	3,015,727	721,319	4,644
1897.....	3,067,116	1,649,797	1,417,319

This statement includes the exports and imports at all United States ports, the figures being furnished by the Bureau of Statistics of the Treasury Department.

Average Monthly Prices of Silver.

In New York per ounce Troy, from January 1st, 1898, and for the years 1897 and 1896:

Month	1896	1897	1898
	Cents.	Cents.	Cents.
January.....	66.77	64.79	67.14
February.....	66.67	64.67	67.67
March.....	66.67	64.67	67.67
April.....	66.67	64.67	67.67
May.....	66.67	64.67	67.67
June.....	66.67	64.67	67.67
July.....	66.67	64.67	67.67
August.....	66.67	64.67	67.67
September.....	66.67	64.67	67.67
October.....	66.67	64.67	67.67
November.....	66.67	64.67	67.67
December.....	66.67	64.67	67.67
Year.....	66.67	64.67	67.67

The Treasury Department estimate of money in the United States on April 1st, is as follows.

	In Circulation	In Treasury	Totals.
Gold coin.....	\$52,129,742	\$147,250,076	\$229,379,818
Silver dollars.....	58,270,705	100,000,000	158,270,705
Gold bullion.....	1,000,000	11,000,000	12,000,000
Silver bullion.....	1,000,000	11,000,000	12,000,000
U.S. notes.....	1,000,000	11,000,000	12,000,000
U.S. currency.....	1,000,000	11,000,000	12,000,000
Nat. bank nts.....	1,000,000	11,000,000	12,000,000
Totals.....	\$176,038,945	\$587,677,000	\$763,715,945

There was a net increase in the amount of circulation of \$29,681,987 as compared with March 1, and \$87,057,951, as compared with April 1, 1897. The circulation per capita on April 1st, 1898, is estimated at \$23.69 by the department.

The United States Treasury reports total revenues in March, \$32,958,750, and expenditures \$31,882,444. For the nine months of the fiscal year from July 1st to March 31st, the total receipts were

\$307,516,713. This included, however, \$52,098,723 on account of the Union and Kansas Pacific liens. Deducting all receipts and payments on those accounts the actual current receipts were \$245,417,900 and the payments \$297,929,902, showing a deficit of \$52,502,012 for the nine months.

POSITIONS WANTED

Advertisements of this class containing not more than five lines will be inserted for not exceeding three months in any year, free of charge to all paid-up annual subscribers. Other than above \$1.00 per month will be charged. Advertisements not accepted for less than one month.

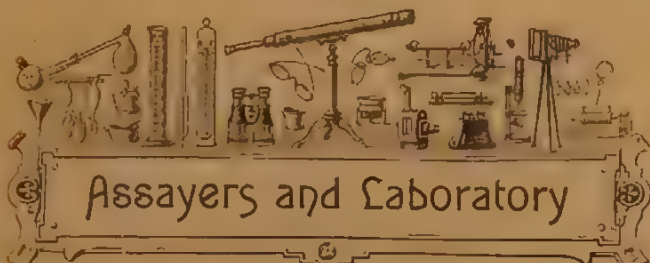
WANTED. by a young experienced man, position as quartermaster mill man, one who can keep mill running.
Address, A. E. CHARLESWORTH, Lockford, Cal.

WANTED by a young man a position as Assayer etc. experienced competent and has a good knowledge of all metallurgical operations. Good references.
Address, T. K. JOURNAL OFFICE, Stimson Block, Los Angeles, Cal.

WANTED. An experienced Engineer with practical knowledge of management of dynamo and electric lights. Also ventilation Assayer with practical knowledge of silver metallurgy. Address with references
VEROL MINING CO., Verol, Arizona

FOR SALE!

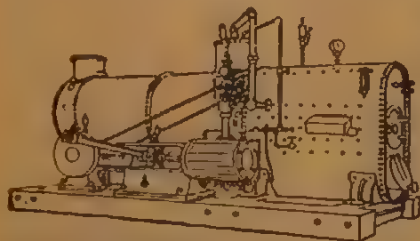
I HAVE some good gold mining properties for sale at reasonable prices, some developed and some real good prospects at Ward, Eldora, Gold Hill, Jamestown, Magnolia, Caribou and Sugar Loaf. Write stating what you want or call on me.
JAMES M. NORTH,
Former County Judge,
Boulder, Colo.

**Assayers and Laboratory**

Glassware and Porcelain Ware, Magnifying Glasses, Thermometers, Altitude Barometers, Compasses, and Microscopes, Wholesale and Retail. Correspondence Solicited. Prices quoted on application.

Pacific Optical Company,

245 S. Spring St., Los Angeles, Cal.

**Engines
Boilers
Saw Mills**

Write for Catalogue and Prices.

RUSSELL & CO. PORTLAND, OREGON.

FOR SALE!

One 36"x84" Water Jacket Furnace, Boiler, Engine Blower, Rock Breaker, Scales, Shafting, Pulleys, Belting, Tools and all fittings and fixtures complete and new, built by Fraser & Chalmers; also one 16x33 Hamilton Corliss Engine; one 12x20 double Cylinder Hoisting Engine. Will be delivered f. o. b.

W. E. DAME, CERRILLOS, NEW MEXICO

Chemist to the Board of Health of the City of Spokane. All Assays guaranteed to check with United States Mint.

E. B. VAN OSDEL, A. M.

Assayer and Analytical Chemist

Anything Analyzed.

109 Howard Street,

Spokane, Washington

PATENTS!

TOWNSEND BROTHERS SOLICITORS OF PATENTS

Patents on Inventions secured in all countries. Copyrights, Trade Marks and Labels.

Office, 9, Downey Block, Los Angeles, Cal. Telephone 347.

The Baker & Adamson Chemical Co.

MANUFACTURERS OF

Strictly Chemically Pure Acids and Chemicals and Ashless Filter Papers

EASTON, PENNSYLVANIA

Oilless Bearings,

For

Rope Tramways, HOISTING Engines, Tackle Blocks, Cam Shafts in STAMP MILLS. A Practical BEARING that RUNS WITHOUT OIL.

The Graphite Lubricating Company

BOUND BROOK, N. J.

Sulphuric Acid

Manufactured by the Western Chemical Co. Denver, Col. For Chlorination, Reburning and other processes. Also Muriatic and Nitric Acids, Blue Vitriol, Copperas Reduced Sulphate of Soda, Etc.

ASSAYERS AND CHEMISTS**WADE & WADE**

Best and Oldest Establishment in Southern Cal.

115½ N. Main St., Los Angeles, Cal

THE JOHANNESBURG SAMPLING WORKS

Purchasers of Gold, Silver, Copper and Lead Ores and Concentrates

Cash Returns Made Within Twenty-four hours after receipt of Ore.

CHAS. R. MORSE, MANAGER,

Johannesburg, Cal.

MINING STOCK QUOTATIONS

LOS ANGELES, CAL.

ROSSLAND, BRITISH COLUMBIA.

Bl Metallic	Meritt	—
Combination	Ontario	—
Con T & P m n	Yukonstone	—
Diamond Mill		—

MEXICO

Name of Company	State	Price
Alamita	Hidalgo	5
Amistad y Concordia	"	24
Angustias	Guerrero	719
Arroyo y Arce	Hidalgo	280
Atuniana y Anexas	Zacatecas	210
Barrador y Cabas	Durango	300
Batallón de Medua	Hidalgo	100
Cabezon y An	Zacatecas	39
Candelaria de Pinos	"	160
Candelaria de Tancitaro	"	20
Candelaria de Chichil	"	80
Capatzen	Durango	120
Carmen	Hidalgo	350
Catitana y San Ram	Tepic	80
Cerro Colorado	Chihuahua	10
Cinco Senores y An	Guerrero	850
Concepcion y Anexas	San Luis Potosi	260
El Oro	Guerrero	40
Esperanza y An	Mexico	1,300
Guadalupe	Guerrero	180
Huautla	Santa Ana	100
Luz de Borda	Michoacan	200
Luz de Maravillas	Hidalgo	100
Patellon	"	150
Palma	Zacatecas	150
Paradisa de los Com	"	5
Real del Monte	Hidalgo	900
Refugio y Va	"	8
Restauradora	Durango	60
Rosario y Anexas	"	50
San Francisco	Hidalgo	270
S. Ped. Chichinuites	"	160
San Rafael y Anexas	"	925
de Free Stock	"	100
San Rafael del Oro	Hidalgo	0
S. Maria de la Paz	San Luis Potosi	740
Sirena	Durango	30
Soledad	Hidalgo	440
Sorpresas	"	240
Trinidad	Guerrero	50
Tlanzingo	Puebla	47
Union	Hidalgo	220
Zaragoza	"	65
Zomclahuacan (gold)	Vera Cruz	1010
Zona M de Pozos	Guerrero	15

NOTE: The above Mexican stocks are figured on the basis of Mexican silver.

BOSTON	
Aetna Con	4 00
Allouez	—
Anacoda	—
Arnold	3 00
Atlantic	27 00
Bonanza	—
Boston and C C	—
Butte & Boston	20 25
Calumet & Hecla	150 00
Canal	—
Centennial	16 50
Centr	—
Domino Coal	21 50
Domino Prof	104 00
Franklin	—
Gold Hill	2 00

NEW YORK.

Alamo	03 1/2
Alce	40
Anacoda	45
Best & Belcher	60
Brunswick	05
Bulwer	—
Crown Point	65
Con. Cal. & Va	—
Cripple Creek Con	08 1/2
Deadwood	—
Favorite	11 25
Fortuna	04
Golden Hecce	45
Gould & Curry	45
Hale & Norcross	—

COLORADO SPRINGS STOCKS

Alamo	03 1/2
Anacoda	45
Argentine Juanita	20
Bancroft	04 1/2
Ben Hur	02 1/2
C & N	008 1/2
C C & M	02
Credde & C	02
C C Consolidated	09
Garfield Grouse	04
Golden Hecce	30
Gold & Globe	—
Gold Standard	03 1/2
Insley	300
Ironclad	04 1/2

Brown Lake	07 1/2
East Armagona	01 1/2
Gold Bug	03 1/2
Little Butte	15
Magganetta	01 1/2
Mohawk Action	25

SAN FRANCISCO.

Alpha	—
Alta Con	10
Andes	24
Belcher	23
Best & Belcher	35
Bodie	—
Bullion	10
Challenge	28
Chollar	50
Confidence	85
Con. Cal. & Va	1 0
Con New York	—
Crown Point	17

SALT LAKE CITY

Alce	1 00
Ajax	40
Alliance	40
Archor	1 25
Bogach	04
Buckeye	02 1/2
Bull. Beck	0 35
Cent. Eureka	28 50
Chloride Point	82
Dalton	01
Daly	1 00
Daly West	5 50
Dalton & Lark	10
Dexter	1 15
Eagle	04 1/2
East Golden Gate	01
Eureka Hill	—
Four Aces	07 1/2
Galena	65
Gemini	—
Geyser-Marion	1 07 1/2
Grand Central	2 00
Homestake	01
Horn Silver	1 35

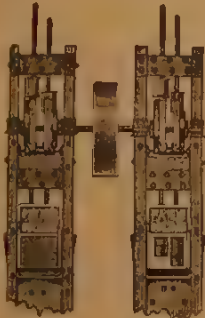
DENVER STOCK REPORT.

Aetna	003 1/2
Alamo	02 1/2
Anacoda	42
Arcadia	004
Consolidated	01 1/2
Argentine	02 1/2
Bangkok-C-Beil	02
Bancroft	04
Ben Hur	02 1/2
Bob Lee	04 1/2
Boston & C C	01 1/2
Chimbarazo	002
C. K. & N	006
Colo. C. & M.	01 1/2
C. C. Con.	06 1/2

HELENA, MONTANA

Am Den & M Co	1 00
Bald Butte	2 50
Helena & Frisco	8 00
Iron Mountain	—

NOTE: The above Mexican stocks are figured on the basis of Mexican silver.



Krogh Manufacturing Company

Successor to San Francisco Tool Co.'s Machine & Mfg Dept.
MANUFACTURERS OF AND DEALERS IN

MINING AND PUMPING MACHINERY,

COMPRISING

Briggs' 2-Stamp Tripple-Discharge Quartz Mill, of Latest improved pattern, Rock Breakers, Ore Feeders, Concentrators, Engines and Boilers, Hoisting Rigs to be operated by Horse, Steam Power or any other motor; Ore Cars and Ore Buckets, Cornish and Jack-head Pumps, Tripple-Acting Pumps, Centrifugal Sand and Gravel Pumps, Wooden Tanks and Pumps for the Cyanide Process, Pipe and Gate Valves, Link Chain Elevators for elevating and conveying all kinds of material. Estimates as to cost of machinery and its erection furnished upon application. Write for Catalogue and Prices.

OFFICE AND WORKS AT

51 Beale St. and 9 to 17 Stevenson St., San Francisco, Cal.

The Boston Pantasma Milling and Mining Co.

Of Victor, California.

Will Mill and Concentrate all kinds of Gold and Silver Ore. F. W. RANDALL, General Manager
RATES REASONABLE and High Percentage Guaranteed. W. WALKER, Agent

Address, F. W. RANDALL, GENERAL MANAGER Victor, Cal.

Pioneer Assay Office

LEW. E. AUBURY,

115 West First Street,

Opposite Natich House, Los Angeles

ADOLF FRESE

ENGINEERING INSTRUMENTS

Barometers, Thermometers, Field Glasses, Microscopes and Accessories. Repairing Promptly Done

126 S Spring St, LOS ANGELES, CAL

The Southern California Lumber Co.,

Stimson Bldg., Los Angeles, Cal.,

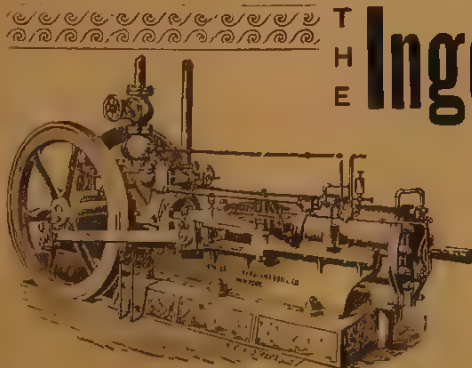
Chas. Wier Manager, sells

LUMBER

At Wholesale Prices

Mining Timbers a Specialty

Write for Prices



AIR COMPRESSOR

THE Ingersoll-Sergeant Co.,

Rock Drills

AND

Air Compressors

MODERN, DURABLE AND
GUARANTEED to do the Work.

Write for Full Particulars

26 Cortlandt Street,

New York City



ROCK DRILLING

INCORPORATED MINES PAYING DIVIDENDS.

NAMES OF MINES	LOCATION	No. of Shares	Capital Stock	Par Value	Amount of Last Dividend	Date of Last Dividend	Total Amount Paid in Dividends	Kind of Minerals Produced
Aetna Cons.	California	100,000	\$ 500,000	\$ 5	\$ 10	Sept 1897	\$ 110,000	Q.
Adams	Colorado	150,000	1,500,000	10	04	October 1895	893,500	S, L, C.
Alaska, Treadwell	Alaska	200,000	5,000,000	25	35½	October, 1897	3,270,000	G.
Alaska Mexican	Alaska	200,000	1,000,000	5	10	Oct., 1897	297,031	G.
Alces	Montana	400,000	10,000,000	25	03	Oct 1897	1,055,060	G.
Anaconda	Montana	1,200,000	30,000,000	25	1 25	May 1897	3,700,000	G.
Anchorage Leland	Colorado	800,000	800,000	1	01	Oct 1897	81,000	G.
American Gold	Colorado	300,000	3,000,000	10	02	Aug 1897	273,000	G, S, L.
Atlantic	Michigan	40,000	1,000,000	25	1 00	Feb. 1897	710,000	S.
Bald Butte	Montana	250,000	250,000	1	03	Sept 1897	512,500	G, C, S.
Bangkok C-Bell	Colorado	600,000	600,000	1	01	July 1896	107,510	S, L, C.
Big Six	Colorado	500,000	500,000	1	00½	April 1897	5,000	G, S.
Boston & Montana	Montana	150,000	3,750,000	25	3 00	Aug 1897	6,275,000	G, C, S.
Bullion Beck and Champion	Utah	100,000	1,000,000	10	50	Mar 1897	2,185,000	G, S.
Bunker Hill and S	Idaho	300,000	3,000,000	10	05	Oct 1897	3,210,000	S, L.
Cariboo	British Col.	800,000	800,000	1	02	May 1897	150,955	G.
C. O. D.	Colorado	50,000	500,000	1	01	March 1896	25,000	G.
Calumet & Hecla	Michigan	10,000	2,500,000	25	10 00	Oct. 1897	50,850,000	C.
Centennial Eureka	Utah	30,000	1,500,000	50	1 00	Mar 1897	2,010,000	S, L.
Central Lead	Missouri	4,000	400,000	100	1 00	Oct 1897	16,000	L.
Charleston	South Car	10,000	1,000,000	100	1 00	Feb 1897	150,000	G.
Champion	California	34,000	340,000	10	25	Aug 1897	278,200	G.
Consolidated, California and Virginia	Nevada	216,000	21,600,000	100	25	March 1895	3,592,800	G, S.
Copper Queen Consolidated	Arizona	200,000	2,000,000	10	25	June 1895	1,910,000	C.
Crescent	Utah	24,000	600,000	25	25	July 1897	280,000	G.
Daly	Utah	150,000	3,000,000	20	25	Mar 1897	2,925,000	S, L.
Deadwood Terra	Dakota	200,000	5,000,000	25	40	June 1907	1,320,000	G.
De Lamar	Idaho	400,000	2,000,000	5	25	Jan 1897	2,250,100	S, L.
Della S	Colorado	1,000,000	1,000,000	1	10	Jan 1897	60,000	G.
Doe Run	Missouri	5,000	500,000	100	50	October 1897	1,000	L.
Dalton and Lark	Utah	2,500,000	2,500,000	1	00½	August 1896	87,500	S, L.
Elkton Consolidated	Colorado	1,250,000	1,250,000	1	03	Sept 1897	381,900	G, S.
El Paso	Colorado	650,000	650,000	1	01	Aug 1897	5,593	G, S.
Florence	Montana	500,000	2,500,000	5	01	May 1897	132,000	S.
Galena	Utah	100,000	1,000,000	10	05	Jan. 1897	71,000	G, S, L.
Garfield Group	Colorado	1,200,000	1,200,000	1	01	Feb. 1897	24,000	G.
Geyser-Marion	Utah	300,000	1,500,000	5	03	Nov 1897	51,000	G.
Golden Eagle	Colorado	1,000,000	1,000,000	1	01	Sep. 1896	10,000	G.
Golden Fleeces	Colorado	600,000	600,000	1	01	Feb. 1897	569,179	G, S.
Gold Coin	Colorado	200,000	1,000,000	5	05	Aug 1897	150,000	G, S.
Gold and Globe	Colorado	750,000	750,000	1	3-10	July 1897	51,625	G.
Hecla Consolidated	Montana	30,000	1,500,000	50	50	Feb 1897	2,175,000	S, G, L, C.
Helena & Frisco	Idaho	500,000	2,500,000	5	04	August 1896	475,000	S, L.
Highland	S. Dakota	100,000	10,000,000	100	20	Oct 1897	3,424,918	G.
Holy Terror	S Dakota	300,000	300,000	1	03	Sept 1897	18,000	G.
Homestake	Dakota	125,000	12,500,000	100	25	Oct 1897	6,131,250	G.
Hope	Montana	100,000	1,000,000	10	10	Nov 1897	732,252	S.
Horn Silver	Utah	400,000	10,000,000	25	12½	January 1896	5,080,000	S, L.
Idaho	Brit. Col.	500,000	500,000	1	05	Mar 1897	152,000	G.
Iowa	Colorado	1,000,000	1,000,000	1	00½	Oct 1897	65,000	G.
Iron Mountain	Montana	500,000	5,000,000	10	01	Sept 1897	497,500	S.
Isabella	Colorado	2,250,000	225,000	100	00½	June 1897	270,000	G.
Kearsarge	Michigan	40,000	1,000,000	25	10	Aug 1897	180,000	C.
Last Chance	Brit. Col.	500,000	500,000	1	04	Jan 1897	42,000	S, L.
Le Roi	British Col.	500,000	2,500,000	5	10	Oct 1897	625,000	G.
Minnesota	Minnesota	185,000	18,500,000	100	1 50	July 1896	3,240,000	L.
Montana Ore Purchasing	Montana	40,000	1,000,000	25	01	October 1897	640,000	G.
Moose	Colorado	600,000	600,000	1	01	January 1896	180,000	G.
Morning Star	California	2,400	240,000	100	8 00½	Sept. 1897	558,800	G.
Mt. Rosa	Colorado	1,000,000	1,000,000	1	00½	Oct. 1896	30,000	G.
Mercur	Utah	200,000	5,000,000	25	12	Oct 1897	825,000	G.
Mammoth	Utah	400,000	10,000,000	25	05½	Nov. 1896	1,150,000	G, S, O.
Moon Anchor Gold	Colorado	600,000	600,000	1	02	Nov 1897	63,000	G.
New Elkhorn	Colorado	300,000	1,500,000	5	24	Sep. 1896	72,000	G.
New York & Hon. Rosario	Central A.	150,000	1,500,000	10	10	Oct. 1897	832,500	S, G.
Napa	California	100,000	700,000	7	20	Oct 1897	870,000	Q.
New Idria Quicksilver	California	100,000	500,000	5	10	Sept 1897	20,000	Q.
Ontario	Utah	150,000	15,000,000	100	10	June 1897	18,445,000	S, L.
Osceola	Michigan	50,000	1,250,000	25	1 00	June 1897	2,172,500	C.
Parrot	Montana	230,000	2,300,000	10	08	June 1897	1,656,122	C.
Pennsylvania Consolidated	California	51,500	5,150,000	10	05	Sept 1897	20,750	G.
Portland	Colorado	3,000,000	3,000,000	1	01½	Oct 1897	1,163,000	G, S.
Princess	Colorado	1,000,000	1,000,000	1	00	Feb 1897	45,000	G.
Quincy	Idaho	100,000	2,500,000	25	4 00	August 1897	9,470,000	C.
Rambler-Cariboo	Brit. Col.	1,000,000	1,000,000	1	02	April 1897	40,000	G.
Itco	Brit. Col.	1,000,000	1,000,000	1	50½	May 1897	187,500	S, L.
Sacramento	Utah	1,000,000	5,000,000	5	00	March 1897	22,000	G.
Small Hopes Consolidated	Colorado	250,000	5,000,000	20	10	Mar 1896	3,275,000	S.
South Swansea	Utah	150,000	150,000	1	05	Oct 1897	59,000	S, L.
Standard	California	200,000	20,000,000	100	10	Sept 1897	3,757,368	G, S.
St. Joseph	Missouri	250,000	2,500,000	10	16	Oct 1897	24,000	L.
Silver King	Utah	150,000	8,000,000	20	25	October 1897	1,237,500	S, L, G.
Slocan Star	Brit. Col.	2,000,000	1,000,000	0.50	05	Mar 1897	350,000	G.
Smuggler Union	Colorado	60,000	5,000,000	100	1 00	Oct 1896	150,000	G, S.
Swansea	Utah	100,000	500,000	5	05	Oct 1897	61,500	S, L.
Tom Boy	Colorado	200,000	2,000,000	10	20	March 1896	410,000	G.
Tamarack	Michigan	60,000	1,500,000	15	3 00	June 1897	4,950,000	C.
Union	Colorado	1,250,000	1,250,000	1	01	June 1896	73,000	S.
United Verde	Arizona	300,000	3,000,000	10	25	December 1893	562,500	C.
Utah	Utah	100,000	1,000,000	20	02	Feb. 1897	175,000	G, S.
Utah Consolidated	Utah	80,000	150,000	5	02	Sept. 1896	3,000	S, L.
Victor	Colorado	200,000	1,000,000	5	10	March 1897	765,000	G.
Western Mine Enterprise	Montana	500,000	500,000	1	10	Mar 1897	12,000	G.
War Eagle	British Col.	500,000	500,000	1	06	October 1896	187,000	G.

S, Silver

G, Gold.

L, Lead.

C, Copper.

Q, Quicksilver.

I, Iron.

B, Borax.

**KLONDIKE MACHINE.**

If you are going to the Klondike or any other country to placer mining you cannot afford to be without one of our placer machines. It will work any class of placer ground, river or sea sands, it will make a clean saving of the fine float gold as well as the coarse. The material is separated into four different grades in passing through the machine, a coarse screen is arranged over the hopper to cut out the rocks and gravel. It is fed regularly on to the screen below; a series of riffles are arranged at the end of this screen to catch any coarse gold that will not pass through the screen, the material then passes over the riffle table (steel hungarian riffles) on to the screen over the amalgamating plates and cylinder, this fine screen cuts out all the coarse gangue, allowing nothing but the water and fine material to pass through the amalgamator, this avoids any scouring whatever. The screen over the cylinder has a side shake; the riffle table and hopper can be run fast or slow to suit the work being done, this machine is just the machine for dry countries, as it requires very little water. By attaching one of our pumps the water can be used over and a large amount of work can be done with a small amount of water, the pump will lift water 20 feet from a stream or well. As a gold saver this machine has no equal, it is light, simple, and durable, can be packed, the heaviest piece weighing 35 pounds, built almost entirely of metal, three sizes, price \$150, \$300, \$450, capacity 10, 25 and 40 tons weight, 175, 400, and 500 pounds. Send for full descriptions.

PACIFIC MINING MACHINERY CO.,

129 First St., San Francisco, Cal.

**The Pulsometer Steam Pump**

"THE MINER'S FRIEND"

Often Imitated--Never Equalled

Over 20,000 In Use

RECENT IMPORTANT IMPROVEMENTS

The Handiest, Simplest and Most Efficient Steam Pump for General Mining, Quarrying, Railroad, Irrigation, Drainage, Coal Washing, Tank-filling and for Pumping Back Liquids heavily impregnated with sediment. Muddy or gritty liquids handled without injury to the Pump.

AGENTS

PARK & LACY CO., A. M. HOLTER HDW. CO., MITCHELL-LEWIS & STAVAR CO.
San Francisco, Cal. Helena, Mont. Portland, Oregon.

Pulsometer Steam Pump Co.

132 Greenwich Street New York City

WEBBER PATENT COMPRESSION GRIP

IS USED ONLY ON THE PATENT

Bleichert Wire Rope Tramway,

AND OTHERS, MANUFACTURED BY

THE TRENTON IRON COMPANY,

TRENTON, NEW JERSEY,

ENGINEERS AND CONTRACTORS

AND

Sole Licensees in North America for the Bleichert System

Also, Wire Rope Equipments

for Surface and Underground Haulage, Transmission of Powers, Etc.

NEWTON M. BELL, AGENT

109 California Street,

SAN FRANCISCO, CAL.

JOHN T. REED**Assayer and Analytical Chemist**

Assays made for all valuable metals. Analysis made of all valuable minerals. Special attention given to the sampling of mines. Estimating the value of and testing the nature of their ores. 100 pound lots of ore sampled, and working tests made by Cyanide, Amalgamation and Chlorination Processes.

OFFICE 622 COURT STREET,

San Bernardino, - - California

Books on Prospecting

MINING, METALLURGY, ASSAYING, GEOLOGY, CHEMISTRY, etc.
WRITE FOR CATALOGUE M

PHILADELPHIA BOOK CO.

Practical, Scientific and Technical Books Philadelphia, Pa.

DR. W. F. DRAKE, E.M.

Mines and Mining

Reports and Examines Mines. Years of practical experience. Correspondence solicited
P. O. BOX 380

SONORA, Tuolumne County, - Cal.

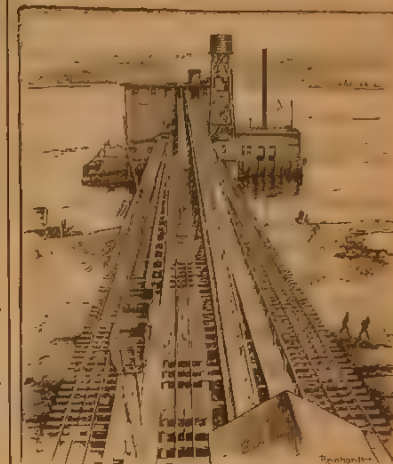
HENRY RIVES ELLIS**Mining Engineer and Metallurgist**

Ores Sampled Assayed and Analyzed Practical working tests by Stamp, Pan and all Processes.

Assay Office and Metallurgical Works,
818 PINE STREET, SAN FRANCISCO, CAL.

Established 1872.
F. E. BRANDIS, SONS & CO.
ENGINEERING INSTRUMENTS
FOR ALL PURPOSES.
814-814 GATES AVE., BROOKLYN, N.Y.
Catalogue mailed on application.

Founded by Matthew Carey, 1784.
HENRY CAREY BAIRD & CO.,
Industrial Publishers, Booksellers and Importers
810 Walnut St., Philadelphia, Pa., U.S.A.
Our new and revised *Catalogue of Practical and Scientific Books* 99 pages, 8vo, complete to February 1, 1898 and our *Catalogue of Minerals*, the whole covering over 1000 subjects, are applied to the Arts sent free of postage to any one in any part of the world who will furnish his address.



FOR conveying Ore, Coal, Slag and Matte. Send full particulars of your wants in writing for prices.

Robins Conveying Belt Co.,

147-149 CEDAR STREET, NEW YORK

Assays \$1.00 Each

Bullion Melted, Refined Assayed and Purchased. 17 years experience.

NO STUDENTS. Send for lists and prices sample mailing envelopes

113 W. SECOND ST., Bet. Spring and Main

MINERALS WANTED

Gold and Silver Quartz Specimens, Crystals, Opals, Turquoise, etc., etc.

Buy in Any Quantities—Pay good prices—Cash

E. C. MOLLER,

638 EAST 86th STREET,

NEW YORK

Dividend Paying and Investment Mining Stock**W. E. HUBBARD & CO.,**

Tel. 505

15 W. 2d South St., Salt Lake City, Utah

CALDWELL BROS.

Tacoma and Seattle Wash.

MANUFACTURERS AGENTS

AND DEALERS IN

MACHINERY and MINE SUPPLIES

We carry a Very Large and Complete Stock



It Will Pay You to Write Us for Quotations

Ores! Ores! Ores!!

Gold, Silver and Lead Ores and Concentrates

Purchased at Reduced Rates for Treatment.

Selby Smelting and Lead Co.

416 MONTGOMERY ST., San Francisco

Consign Shipments to Vallejo Junction, Cal

W. O. ABBOTT, ASSAYER

ASSAYING IN ALL ITS BRANCHES
CHEMICAL DETERMINATIONS ACCURATELY MADE

TOMBSTONE - - - ARIZONA

Spadone's Concentrator Belts



This illustration shows the edge flanging outwardly as it passes over the pulley. This relieves the strain from the top and bottom of the edge by directing the strain into the middle of the inside face surface of the edges. Heretofore all belts have been so constructed that when they pass over the pulleys or rolls, a direct strain comes upon the top or at the base of the edges, causing the edges to break away from the body of the belts in a very short time. *Leave it to Spadone's Concentrator Belts.* Belts made to fit any machine—4, 5 and 6 feet wide. Prices and samples on application.

Send us your order for Water, Air Drill, Steam, Suction and Fire HOSE, RUBBER BELTING, RUBBER PACKING and LEATHER BELTING.

The Gutta Percha Rubber and Manufacturing Company,

30 and 32 FREMONT STREET,

SAN FRANCISCO, CAL.

MATHISON & CO.

29 LIBERTY ST.,
NEW YORK CITY

ANTIMONY

BUY

ANTIMONY ORES AND
CRUDE ANTIMONY

* WRITE FOR FULL PARTICULARS

Minerals Wanted

Good Crystallized Specimens, Loose and detached
Wanted in Quantity

If you have any Ores, unidentified, write me

ROY HOPPING.

5 and 7 DEY STREET,

NEW YORK CITY



C. DUCOMMUN,

300-302 N. MAIN STREET.

LOS ANGELES



Assayers Material Mine and Mill Supplies

DIXON'S Black Lead Crucibles, Fire Clay Crucibles, Muffles, Scorifiers, etc., Quicksilver, Drill Steel, Retorts, Mortars, Gold Pans, Drilling Hammers, Drifting Picks, Horn Spoons and Shovels

Bickford Drill Co.

CINCINNATI, OHIO.

Upright Drills, Machinists' Tools

RADIAL AND UNIVERSAL RADIAL DRILLS

NORRIS HIGH-SPEED ATTACHMENT Will Double your Drilling Capacity at a Nominal Cost. Write for Catalogue

Henshaw, Bulkley & Co., San Francisco, Cal.

WHITNEY COMPANY

Iron and Steel. Miners, Blacksmiths, Machinists Supplies

Agents for Arizona and New Mexico for Marsh Steam Pump. Agents Hercules High Explosives, Miner's supplies by car load, Fairbanks-Morse Diesels, etc., Machinery and Engines. Full line of Steam Fittings and ENGINEERS' Supplies. A specialty made of Supplying the Mining Trade of the SOUTH WEST

ALBUQUERQUE

NEW MEXICO

When Installing a Tramway Have the

Finlayson Patent Automatic Wire Rope Tramway

The Only Automatic
(Double
rope) Tramway Built

Economy
in Operation

Simplicity in
Construction

Easy
Running

THE COLORADO IRON WORKS COMPANY,

ESTABLISHED 1860

DENVER, COLORADO.

SOLE MANUFACTURERS

ENGINEERS AND MANUFACTURERS OF

Ore Milling
and Smelting
Equipments

CATALOGUE ON APPLICATION



CHALLENGER BELCHER ORE FEEDER
Will feed both wet and dry ores



Roller for crushing ore

A. A. BAILEY

MANUFACTURER AND DEALER IN THE LEADING

Packings and Engineers Supplies

LUBRICATING OILS AND COMPOUNDS

Exclusive Manufacturer of the **UNSURPASSED**
BAILEY

Anti-Friction Metal and all other Grades of Babbitt Metal

Sole Agents for Reliable Steam Pumps

300 South Los Angeles Street, LOS ANGELES, CAL.

Geo. F. Blake Mfg. Co.

NEW YORK, N. Y.

Boiler Feed Pumps,
Tank or Light Service Pumps,
Combined Air and Circulating Pumps,
Drainage and Irrigating Pumps,
Special Fire Pumps,
Independent Air Pumps and Condensers
Water Works and Power Pumps.

Henshaw, Bulkey & Co., Agents. San Francisco, Cal.

"READY ROCK" ASPHALT ROOFING* THE STANDARD ROOFING OF THE
UNITED STATES

Absolutely the most durable, convenient and strongest roofing material made.

"Ready Rock" Asphalt Roofing Co.

1006 North Main Street,

Los Angeles, Cal.

TELEPHONE MAIN 1676

Why SEND YOUR MONEY EAST FOR

Shoes and Dies, Camp Tappets, Car Wheels, Shafting, Hangers,
Pulleys, Ore Cars and Iron and Brass Castings, when they can
be obtained for the same price and in less than half the time

AT THE

Albuquerque Foundry and Machine Works,

Repairing of Mill and Mining Machinery a Specialty, Albuquerque, New Mexico

**F. A. A. WILLIAMS,
Mines & Mining**A free Milling Gold Property at a bargain
Correspondence Solicited

TRINIDAD, COLORADO

N. D. BURLINGHAM, M. E.

Practical Examinations of Mines
anywhere. Plans and estimates
for Mining Machinery on
short notice.

FORTY YEARS EXPERIENCE IN MINING AND MILLING

DENVER BLOCK, LOS ANGELES

ASSAYERS AND CHEMISTSWorking tests of Ores by all processes.
Samples by mail or express solicited**TREMAINE & FROELICH,**
132 Third St., PORTLAND, OREGON**CHICAGO SCHOOL OF ASSAYING,**

J. J. DUNRAVEN YOUNG, Director.
1759 MONMOUTH BLDG., CHICAGO, ILL.
Courses in: 1. General Chemistry, Chemical Analysis,
2. Fire Assaying of Gold, Silver, Copper and
Lead Ores etc. 3. Ore Testing including Mill
Tests by Mercury, Cyanide and Chlorination
processes. Individual instruction only. Open
evenings. Opportunity for Miners & Prospectors

Harper & Reynolds Co.,*** MINING + SUPPLIES ***

— AGENTS FOR —

**Glant Powder Co., Galvanized Spiral Pipe,
Steel and Iron.**

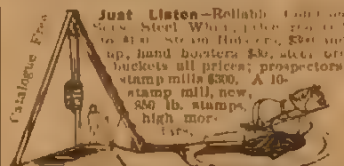
152-154 North Main Street,
151-152 North Los Angeles Street, . . . } LOS ANGELES, CAL.

**California Bellows Manufacturing Co.**
123 Beale St., San Francisco, Cal.**BLACKSMITH BELLOWS**
And Bellows of Every Description

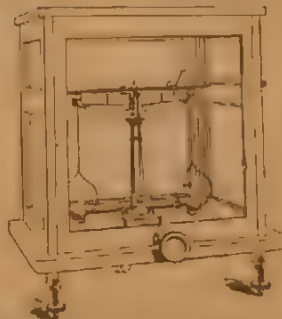
Write us for our new catalogue

THE CHEAPEST PLACE ON EARTH

TO OUTFIT A MINE IS AT

The J. H. MONTGOMERY MACHINERY CO.,
1220-22 Currie St., Denver, Colo., U. S. A

Just Listen—Rollable and
Steel Wheel, take you up
to 400 ft. on rollers, \$200 and
up, hand hoisters \$30, steel ore
buckets all prices; prospectors'
stamp mill \$500, A 10-
stamp mill, new
350 lb. stamps,
high mor-
tors,
late of improved, only \$400. This is a tested and
amalgamation and concentration mills built to
fit the ore and guaranteed to save what we save.
Coal Mine equipments, Screens,
Jigs, Tramways, Armaters, Chilled
Mills, Ore Scales, etc., Cornish
Mills, 12x20, weight 6,000 lbs.,
price \$580; Feeders, Rock Drills
and Compressors, Bumping
Tables, Chlorination Mills, etc. Blake Crush
ers, 7x10, weight
8,100 lbs., only \$350.
Cyanide Mills.
Our patent
Turntable Car
has equal load
on each
wheel wears
even, dumps au-
tomatically. Our 100
page catalogue with
hundreds of useful tables
FREE. Best Machinery and
least money for it.

QUEEN NO. 4 ASSAY BALANCE

Aluminum Beam, Agate Knives and Planes
Sensitivity 1-50 mg. The Best Low-Price Assay
Balance on the Market. Send for Circular.

QUEEN & CO.,Optical and Scientific Instrument Works
1010 Chestnut Street,
Phila. Office, 116 Pulton St Philadelphia

ESTABLISHED IN 1840

HENRY TROEMNER,

710 Market St.,

Philadelphia, Pa

**Assay Balances and Weights**In use in all the U. S. Assay Offices
in America

PRICE LIST ON APPLICATION.

JEFFREY

Roller, Steel and Special Chains

**ELEVATING
AND CONVEYING
MACHINERY.**

FOR HANDLING MATERIAL OF ALL KINDS

**HIGHER TRANSMISSION
MACHINERY.**

COAL MINING MACHINERY.

Wire Cable
Conveyors.

THE JEFFREY MFG. CO.
Columbus, Ohio.

"HENDY" IMPROVED**Triple Discharge Two-Stamp**

— MILL —

Capacity six to ten tons per day
Price, \$450.00**JOSHUA HENDY MACHINE
WORKS**

38 to 44 Fremont St., San Francisco, Cal.

ROGERS & BALDWIN,**MACHINE SHOPS**All kinds of repairing
for Engines, Boilers
and Machinery
Riverside, Cal.**ANTIMONY.**

We buy Antimony Ore in any quan-
tity and pay prompt CASH for same.
Write us and let us know what you
have.

Chapman Smelting Works Co.,
(INCORPORATED)
284 Battery Street, San Francisco, Cal.**J. B. Pope**U. S. Mineral Surveyor,
San Bernardino, Cal.

A. H. WARD

Cable Address, Luckward

C. A. LUCKHARDT & CO.

Nevada Metallurgical Works,

Established 1869

71 AND 73 STEVENSON STREET, SAN FRANCISCO, CAL.

Assaying, Analyses, Sampling.

Practical Working Tests of Ore by all Processes

STAMP MILL AND CONCENTRATOR IN OPERATION ON THE PREMISES

Pacific Coast and Mexican Agents

— FOR —

Kearby & Mattison's

**Magnesia Sectional
Steam Pipe and Boiler
Covering**The only Covering that water
will not destroy. Indispensable
in covering pipes conducting
steam to pumps in mines.

ALL KINDS OF ASBESTOS GOODS

DE SOLLA DEUSSING COMPANY,

Send for Testimonials.

4 California Street, San Francisco, Cal.

EDWARD B. READ,

Engineers' Specialties, Cylinder and Machinery Oils, Cylinder Lubricators,

LORD'S BOILER COMPOUND, Cyclone Steam Flue Cleaner, Engine Compound
Electric Spiral Packing, Shafting Compound, Crank Pin Grease, Wire Rope
Grease, Extra Gear Grease, Belt Grease and Oil, Skin Grease, Elevator
Grease, Crescent Flue Scraper, Oil Cups, Compound Cups, Dibble Lubricator,
Packing and engineers' supplies. CORUNDUM WHEELS.

No. 12 First Street,

San Francisco, Cal.

New Haven Mfg. Co.

NEW HAVEN, CONNECTICUT

IRON WORKING TOOLS

Engine Lathes, Pulley Turning Lathes, Iron Planers,
Slotters, Upright Drilling Machines, Horizontal
Drilling and Boring Machines, Etc.**HENSHAW, BULKLEY & CO., Agents, San Francisco, Cal.**

The Giant Powder Company

+ CONSOLIDATED +

Principal Office: 430 California Street
SAN FRANCISCO, CAL.

*

P. J. NOLAN, General Agent for Mexico
Aparato 230 CITY OF MEXICO.

*

A. A. SPARKS,
Resident Agent Southern California.
Room 428 Bradbury Block, LOS ANGELES, CAL.

*

AGENTS

Roy & Titcomb, Nogales, Arizona
Samuel Hill, Prescott, Arizona
Kellner's Store, Phoenix, Arizona
Thomas Wilson, Tucson, ArizonaA. Calderon, Hermosillo, Mexico
G. Moller & Co., Guaymas, Mexico
Wohler Barthing & Co., Mazatlan, Mex.
Deilus & Co., San Blas, MexicoJulio Hilderbrand & Co. Durango, Mexico
Julio Hilderbrand & Co., Tofia, MexicoJ. P. De Fresno, Culiacan, Mexico
T. Robison Bours, Alamos, MexicoManufactures Dynamite, Black Blasting and
Sporting Powders.**Quartz Screens**A specialty. Round, slot
or buried slot holes.
Genuine Russia Iron,
Homogeneous Steel, Cast
Steel or American plan-
ished Iron, Zinc, Cop-
per or Brass Screens for all purposes. CALIFORNIA
PERFORATING SCREEN CO., 146-147 Beale St., S. F.per or Brass Screens for all purposes. CALIFORNIA
PERFORATING SCREEN CO., 146-147 Beale St., S. F.**E. E. BURLINGAME'S
ASSAY OFFICE**Established in Colorado, 1866. Samples
by mail or express will receive prompt
and careful attention. Gold and Silver
Bullion refined, melted and assayed, or
purchased.

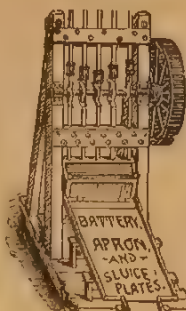
Address 1736 and 1738 Lawrence St., Denver, Col.

**FOR DRAWING INSTRUMENTS:
THEO. ALTMAYER & SONS,
345 RIDGE AVE., PHILADELPHIA.**

SEND FOR CATALOGUE



TANKS

OF EVERY DESCRIPTION
— FOR —**Mines, Mills and Cyanide Plants
Patent Non-Shrinking Water Tanks**The only Tank that will stand the Desert
and Hot Climate.
Write for Catalogue and Estimate on any kind
of Tank Work.**Pacific Tank Co.**23 BEALE ST., SAN FRANCISCO
348 EAST 2d STREET, LOS ANGELES

To Gold Miners!

Silver Plated Copper AMALGAMATING PLATES

For Saving Gold In Quartz and Placer Mining.

EVERY DESCRIPTION OF MINING PLATES MADE

Only Best Copper and Refined Silver Used. Old Min-
ing Plates Replated. Twenty-six Medals Awarded.
Gold, Silver, Nickel, Copper & Brass Plating.**Denniston's San Francisco Plating Works**

653 and 655 Mission Street, San Francisco, Cal.

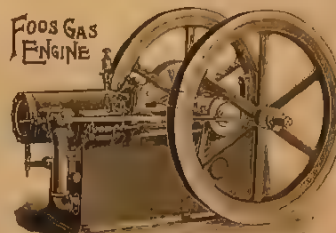
Telephone, Main 5931.

E. G. DENNISTON,

Proprietor

Send for Circular.

Foos Gasoline and Distillate Engine

The Best in the MarketTen Engines lately put in the Rand District
operating Hoists, Mills and Pumps. We have
sold 300 of these engines and we warrant them
satisfactory. The Triumph Pump for deep
wells throws a steady stream. No cranks or
dead centers. The rods more vertically re-
quire less power than other pumps.Studebaker Vehicles,
Machinery, Engines**S. W. LUITWEILER CO.**200-202 N. LOS ANGELES ST.
LOS ANGELES, CAL.

ESTABLISHED 1859

Herman Kohlbush Sr.

59 Nassau Street,
New York, N. Y.

MANUFACTURER OF

**Fine Balances
and Weights**For every purpose where accuracy
is required.

...

If you cannot obtain my goods
from your supply house send direct to
me for catalogue and prices.

THE WILSON Forged High Grade Steel Shoes and Dies

Guaranteed to Wear Longer and Prove Cheaper than any others.
Made by use of Special Appliances. Patented Aug. 16th, 1893.

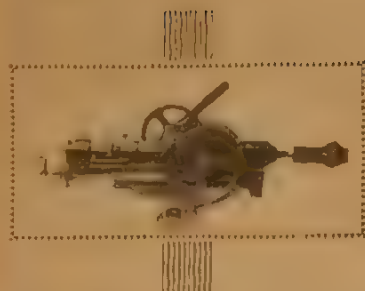
— Made only by —

WESTERN FORGE AND ROLLING MILLS
St. Louis, Missouri**JOSHUA HENDY MACHINE WORKS**

SOLE AGENTS

38 to 44 Fremont Street,

San Francisco, Cal.



The JACKSON Hand Power Rock DRILL

We guarantee Satisfaction or Money Refunded

NO JAR

EASILY OPERATED

The Jackson Drill and Manufacturing Co.

Exhibition Rooms,
1709 California St.,

DENVER, COLORADO

BOX
1362

Office
1767 Larimer St.

The NATIONAL PIPE BENDING CO.

NEW HAVEN, CONN.

Simplicity

Cheapness

Reliability

Effectiveness

National Feed Water Heaters

Used by over 300 Electric Light Stations

Awarded Highest Premium at World's Fair

HENSHAW, BULKLEY & CO.,

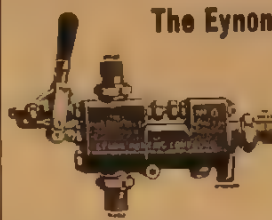
Agents
San Francisco, Cal.

P. & B. PAINT

FOR MINES, SMELTERS, CHLORINATION WORKS,
THE CYANIDE PROCESS.

P. & B. Roofing put up in Rolls to lay 200 square feet, with Paint and Nails.
Absolutely Acid and Alkali Proof.

PARAFFINE PAINT CO., Manufacturers, 524 S. Broadway, Los Angeles



The Eynon-Korting Compound Injector

The Best for
Quartz Mill
and Smelter
Boilers



Brass, Bronze and Copper Castings of every description
Send for Catalogue of the
Injectors, Condensers, Blowers, Ventilators, Blast Nozzles,
Siphons, Exhausters, Etc.

THE EYNON-EVANS MFG CO.,
11th and Clearfield Streets.
PHILADELPHIA, PA

E. C. CREEL, Presidente.

JUAN A. CREEL, Gerente

Compania Industrial Mexicana

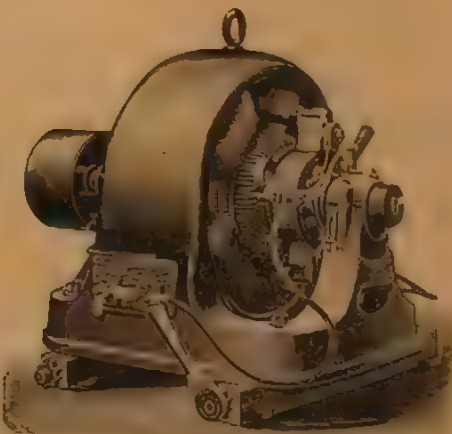
Ferreria
Fundicion de Fierro y Bronce

Fabricantes...

de toda clase de

Maquinaria para minas y
Haciendas de Beneficio

Quebradoras Maquinas de vapor.
Retortas, Ruedas Hidraulicas, Calderas
de todas clases, Maquinas de extraction. Car-
ros para mineral, Molinos Huntington. Bombas
Malacates de Vapor, panes de amalgamacion.
Concentradoras, compresores de aire. Lavaderos,
Haciendas de Lixiviacion; Hornos de chaqueta
["Water Jackets."]



Dinamos, Motores y Material
Electrico.

BARATURA y PRONTITUD.

Se envian circulares Pedido.

Para informes dirigirse al gerente,

Se solicita la correspondencia.

JUAN A. CREEL,

Chihuahua,

Mexico



W. T. GARRATT & CO. Brass Machine Works.

MANUFACTURERS

HOOKER STEAM PUMPS,
MINERS' SINKING PUMPS,
TRIPLE PLUNGER PUMPS,
JACKHEAD MINING PUMPS,
CENTRIFUGAL PUMPS,
GONGS FOR MINE SIGNALS,
LUBRICATORS & OILERS,
SUCTION HOSE AND COUPLINGS,
HYDRAULIC PIPES,
IRON PIPE AND FITTINGS
BABBITT METALS,
PACKINGS
REPAIRING PROMPTLY ATTENDED TO.

138 to 148 Fremont Street,
SAN FRANCISCO, CAL.



MINERS' OUTFITS.



IRON MORTARS,
MILK MORTARS,
GOLD WASH PANS,
MINERS' HORNS,
RATERS, CRIBBLES,
HORSE-SHOE MAGNETS,
MAGNIFYING GLASSES,
IRON RETORTS,
CHEMICALS, SCALES,
WEIGHTS, ETC.

Including a full as-
sortment of Mine and
Mill Supplies, Assay-
ers' Materials, Etc.

Sole Agents for the
Pacific Coast for the

W. S. TYLER WIRE WORKS CO.

Manufacturers of

Steel and Brass Wire Battery Screens
Agents for Baker & Adamson's Chemically
Pure Acids. A full stock always
on hand.

Nitric Acid, sp. gr. 1.42; Muriatic Acid, sp. gr.
1.20; Sulphuric Acid, sp. gr. 1.845.

JOHN TAYLOR & CO.

83 FIRST ST., SAN FRANCISCO
Prices on application.

The State Ore Sampling Co.

DENVER, COLORADO

Gold, Silver, Lead and Copper Ores and Matte
sampled and marketed to the best advantage.
With much in mills and much very our facilities
for sampling ores are the best.

Our long experience in the market enables us
to obtain the highest prices for all marketable
ore. Write for our "Reference Book." Send
analysis of your ore for prices and information.

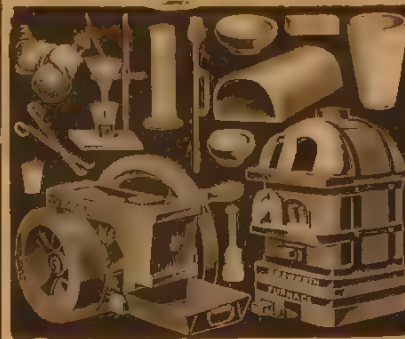
BAILY & MONNIG, Managers.

Silver City Reduction Company

This plant has been purchased and will be
operated in the future by the Estate of the late
Senator George Hearst of California, under the
general management of D. B. Gillette, Jr.
It is the intention of the present management
to largely increase the capacity of the plant and
equip it with every modern appliance for the
successful and cheap treatment of ores and con-
centrates.

Consignments and Correspondence Solicited.
Advances will be made on ores.

Silver City, Grant Co. New Mexico



FACTORY:

3101-3141 Blake St., 1742-1746 Champa St., Denver, Col.

THE Denver Fire Clay Co

Assayers' and Chemists' Supplies

MANUFACTURERS OF

Crucibles, Scoffers & Muffles

And all other kinds of

Fire Clay Material.

SPECIALTIES—Strictly c. p. Acids

Test Lead, Bone Ash, Cyanide

Potash, Argol, Borax, Borax Glass

Iron Sulphides, Litharge, Soda

Mining Fluxes, etc.

Sole Agents for the

Alusworth Balances

OFFICE:

Analytical Chemists and Assayers

ANALYSIS OF ORES, Waters,
Chemicals, etc. & Impure
Woods, etc.

HAMBLIN & MORRISON,
411 Chestnut Street, PHILADELPHIA, PA.

S. L. BURBRIDGE,

CONSULTING

MINING AND METALLURGICAL ENGINEER

405-406 BAILEY BLOCK,

Mines examined and reported on.

SEATTLE, WASHINGTON

FAUTH & COMPANY,

(O. M. SARGENT),

Engineering and Mining Instruments,

WASHINGTON, D. C.

Attention is called to our newly improved
Mining Transit, with best Solar Attachment
and Vertical Sighting Telescope and Quick
Leveling Head

ASSAYER and CHEMIST

Mark samples plainly, advise by letter
of full details, with charges enclosed.
Postage on orders, return free.

C. H. VOLL,

34 Rexwell Bldg.

SEATTLE, WASHINGTON

CLARENCE HERSEY,

Assayer and Chemist,

(Established 1879)

LEADVILLE, COLORADO

Samples by Mail or Express Re-
ceive Prompt Attention

SPECIMEN ASSAY PRICES:

Gold silver and lead, \$1.00; any two of the
above, 75c; any one of above, 50c; copper analy-
sis, \$1; platinum, nickel or tin, \$5.00.

Write for full price list and mailing envelopes



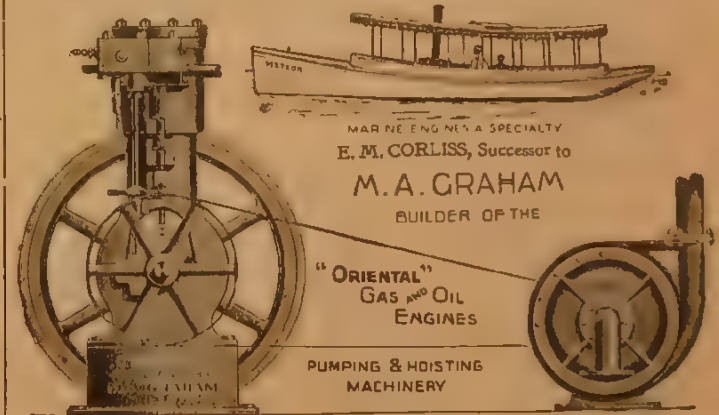
GOLDSMITH BROS.

Refiners and Assayers

63 and 85 Washington Street,

Chicago, Illinois

Shipments of Gold and Silver Bullion solicited. We pay 20.25 per ounce for gold, market
price for silver contained therein. No charge for separating. ASSAYS of Ores and ANALYSIS of
all kinds Promptly Made



MARINE ENGINES A SPECIALTY

E. M. CORLISS, Successor to

M. A. GRAHAM

BUILDER OF THE

"ORIENTAL"
GAS AND OIL
ENGINES

PUMPING & HOISTING
MACHINERY

105 Beale Street San Francisco, California.

WHITE, ROGERS & CO.'Y.

CONSTRUCTING ENGINEERS AND MILLWRIGHTS

306 PINE STREET, SAN FRANCISCO, CAL.

Sole Pacific Coast Agents and Builders of the Celebrated

WILFLEY CONCENTRATOR,

Price \$450 f.o.b. San Francisco

One of these Machines will take the place of TWO or THREE Belt Concentrators of any make and do very much better work.



WILFLEY CONCENTRATOR

SEND FOR CIRCULARS

Some Practical Reasons Why the Wilfley Concentrator Should be used in Gold Mills:

1. It will successfully handle three or four times more material than any belt Concentrator made, barring none.
2. It will save more sulphurets in proportion while so doing, and catch any float gold, amalgam or quicksilver which may escape from mortars or plates.
3. It will make cleaner and much more valuable concentrates, thus saving useless expense for transporting valueless material, as also extra cost for treatment.
4. It requires little or no attention when once adjusted and no expert is required to either adjust or run the machine.
5. It will save much expense in power and room, and the first cost of a mill requiring concentrators.
6. It has no expensive bolts to crack and wear out, nor complicated machinery to keep in repair.
7. It is the only sensible plan of concentration, as any kind of material can be worked, which is not true of any style of belt machine.

Silver Plated Amalgam Plates

FLINT & LOMAX, DENVER, COLO.

N. OHLANDT & CO.

MANUFACTURERS OF

Best Quality of BONE ASH for Assayers.

Our Goods are used in all parts of the United States and Mexico.

EXTRA No. 1 and No. 2

CORRESPONDENCE SOLICITED

327 MARKET STREET, SAN FRANCISCO, CAL.

J. C. WINANS, Sole Agent Peerless Rubber Manufacturing Co.

Winans' Anti Friction Powder, Gould's Ring Packing, Peerless Rod Packing, Eclipse Tubular Gaskets, Pulver Lubricating Compound, Rubber Pump Valves, Vulcanized Fibre Pump Valves, Magnolia Anti-Friction Metal, Tux Packing, Spiral Packing, Square Flax, Peerless Plumbago Sheet, Peerless Rainbow Sheet, Sheet Rubber of all kinds, Scotch Water Glasses, W. A. C. Water Glass Cutters. Deal in and Supply all Packings on the Market, Special Hydraulic Pump Packing, Winans' Pressure Regulator; absolutely automatic. Pronounced by Experts the Best Manufactured.

Engineers' Specialties

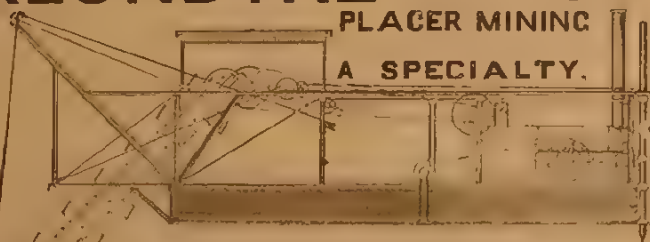
220 FREMONT STREET, SAN FRANCISCO, CAL.

KLONDYKE

Our Mining Dredge Is Just the Thing for It

PLACER MINING

A SPECIALTY.



Dredging & Mining Machinery Co.,

FOOT 4th VIADUCT
NEXT TO RIVER

Kansas City, Mo.

Chicago and Aurora Smelting and Refining Co.

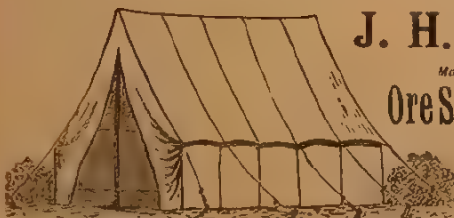
PLACERS OF

Lead, Silver and Gold Ores

Manufacturers of BLUE VITRIOL

Works at Leadville, Colo., Aurora, Ill., and Chicago, Ill.

General Office, Woman's Temple, Chicago, Illinois



J. H. MASTERS,

Manufacturer of and Dealer in

Ore Sacks, Tents & Camp

Furnishings

217 Commercial St.,

LOS ANGELES, CAL.

GOLD and SILVER REFINERS & ASSAYERS

Bullion Bought. No charges for parting: Gold \$20.30 per oz., Silver and Platinum at market prices. Assaying in all branches. Working tests made by all processes. Wastes and Concentrates bought. Prompt attention. Best Services. Your Trade Solicited

PENN SMELTING AND REFINING WORKS, 901-903 Filbert St., PHILADELPHIA, PA.

Stockton Assay Office

Gold and Silver Assays, \$2.00.
Five Assays and over, \$1.50 each

329 E. Magnolia street, Stockton, Cal.

Send Samples and remittances by Express or mail.

KLONDIKE OUTFITS

I am prepared to contract for the complete outfitting of Parties going into the Klondike from Vancouver, B. C., the best place from which to outfit and sail.

Direct Steamers. No duty to pay on goods. Write or wire for full particulars

PERCY W. CHARLESON, General Broker
VANCOUVER, B. C. P. O. Box, 187
TABLE ADDRESS, "CHALCOOVER"

BAGLE PACKING



White Eagle, Graphite, Hydraulic, Nitr and other brands for all purposes for which packing is used. Write for samples and prices. Manufactured by James Glandling Co., 1907-9 North 6th St., PHILADELPHIA, PA.

Mathematical, Scientific and Drawing Instruments



911 Vine Street,

Philadelphia, Pa.

OTTO HECKELMANN

FERDINAND McCANN

ASSAYERS AND CHEMISTS

Heckelmann & McCann * * Bullion Dealers

Cash paid for all kinds of Gold, Silver and Ores. All assays and Chemical Analysis at Mexican Silver Rates, 50 per cent. Less than American Price.

PUEBLO DE SAN FRANCISCO, No. 6

CITY OF MEXICO

Turbine WATER WHEEL

Adapted to all Heads from

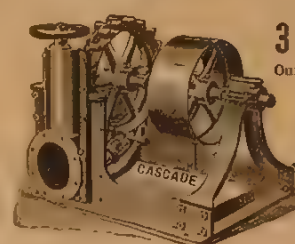
3 Feet to 2000 Feet

Our experience of 33 YEARS building Water Wheels enables us to suit every requirement of Water Power Plants. We guarantee satisfaction.

Send for a Pamphlet of either Wheel and write full particulars.

James Leffel & Co.

SPRINGFIELD, OHIO, U.S.A.



\$35,000,000 in Dividends paid out by Utah Mines up to date.

UTAH MINING STOCKS

Weekly Market Report on application.

Quotations by wire or mail.

Reference: Any Bank in Salt Lake City.

P. J. CONWAY & CO.,

SALT LAKE CITY, UTAH



DANIEL'S PATENT P.P.P. Diagonal Rod Packing

For Steam, Water, Oil, Air, Ammonia, Etc.

SAVES LABOR
SAVES POWER
SAVES MONEY

It Represents Highest Class Materials and Greatest Service.



NO PAY IF NOT AS CLAIMED

SLIDING WEDGES, COMPENSATING FOR WEAR. OIL CUSHION TO ENAMEL AND LUBRICATE THE ROD.

Best Packing for use in MILLS, MINES and SMELTERS

MANUFACTURED ONLY BY

G. A. DANIEL, Philadelphia, Pa.

To Insure getting the Genuine see that Every Box and Wrapper has our Trade Mark.

THOMAS PRICE & SON

Analytical Metallurgical and Physical Testing Laboratory

524 SACRAMENTO STREET, SAN FRANCISCO, CAL.

HENDRIE & BOLTHOFF MFG. & SUPPLY CO.

The Pioneer Mining Machinery House of the West

Immense Stock

Immediate Shipments

We solicit your Correspondence. Write for prices on what you want.

Once a customer * Always a customer

SALESROOMS AND GENERAL OFFICES:

1601-1617 17th Street, - Denver, Colorado



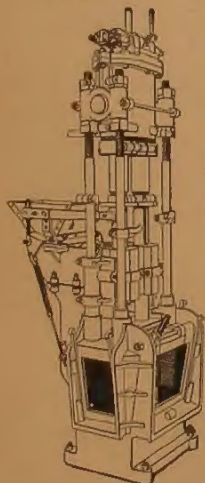
Engineers' and Draughtsmen's Supplies

Sole agents for Riefler's round system drawing instruments and Albert Ott's Planimeters, Planigraphs and other instruments of precision. Levels and transits of superior make.

F. WEBER & CO. PHILADELPHIA
1125 CHESTNUT ST.,

Subscribe for * the Journal

The Machinery and Electrical Company,



TRUBAIN STEAM STAMP

Machinery and Supplies

MINING HOISTS, WHIMS, ORE BUCKETS,
Bates Corliss Engines, Snow Steam Pumps
OIL CITY BOILERS AND ENGINES,
Hercules Gas Engines, Lawrence Centrifugal Pumps
GATES IRON WORKS MINING MACHINERY
Tremaine Steam Stamp Mills
Electric Lighting, Railway and Transmission Apparatus
Washburn & Moen Mfg. Co's Wires and Cables

Also Dealers and Jobbers in

Shafting, Belting, Dodge Wood Pulleys, Hangers,
Boxes, Etc.

WRITE FOR PRICES

351 & 353 N. Main St. Los Angeles, Cal

EASTERN PRICES BEATEN

IMPROVED FACILITIES, FINEST WORK
LOWEST PRICES



PERFORATED SHEET METALS

For Flour and Rice Mills, Grain Separators, Shaker Screens, Gravel and Cement, Revolving and Shot Screens, Stamp Batteries, Iron, Steel, Russian Iron, American Platinized, Zinc, Copper and Brass Screens for all uses. Inventor and Manufacturer of the celebrated Slot Barred and Diagonal Slot punched Screens.

MINING SCREENS A SPECIALTY

Mill owners using screens extensively, can contract for large supplies at favorable rates J. W. QUICK is the only competent and successful manufacturer of Screens on the Coast, having furnished Screens to the Principal Mills of

California, Nevada, Alaska, Mexico, Arizona, Central America, Australia and British Possessions.

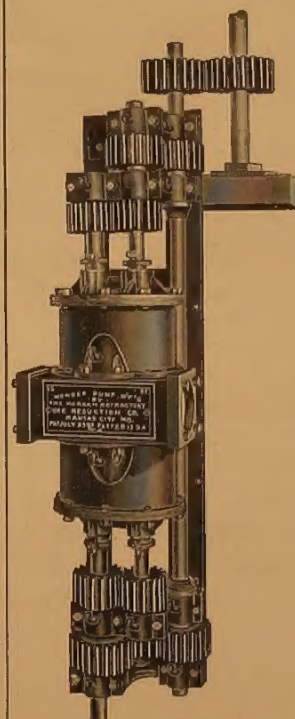
San Francisco Pioneer Screen Works

(Established 1860)

221 and 223 FIRST STREET, SAN FRANCISCO.

J. W. QUICK, Prop.

THE NEW, IMPROVED WONDER PUMP,



Especially Adapted to MINING PURPOSES

For full particulars and Catalogues Apply to

**The Wonder Pump
Manufacturing Company**

Armour Building, Kansas, City, Mo.



AINSWORTH NO. 045

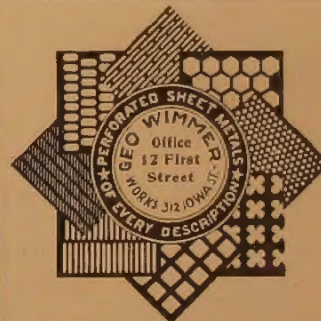
SENSIBILITY.....1-50 MILLIGRAMME

Eight-inch beam, single rider attachment, and designed for a silver button balance to carry a heavy load.

Complete catalogue of Assayers' and Chemists' supplies, including this and other balances, mailed upon application. SELLING AGENTS,

The Denver Fire Clay Co.,

1742-1746 Champa St., Denver, Colo.
P. O. BOX, 1540



MANUFACTURER AND DEALER IN

Perforated Sheet Metals,

Steel, Russian Iron, American Platinized
Zinc, Brass and Copper.

Mining Screens of Every Description

SAN FRANCISCO, CAL.

HALLIDIE PATENT ROPEWAY

— FOR THE —

Transportation of Ore, Fuel and other material, has been erected by us all over the country and is the most economical and efficient method known. Nothing to get out of order; has always given satisfaction.

California Wire Works

[LICENSEES]

Office, 330 Market St., San Francisco, Cal.



Mention the Journal

WIRE TRAMWAYS

Ropeways,
* Incline Planes,
and Railways.

Hoisting Apparatus, Patent Grip Pulleys, Transmission of Power by Wire Ropes; 25 years experience; Send for Ropeway Pamphlet.

California Wire Works

WORKS:

332 Bay Street, San Francisco, Cal

The Little Alaska Gold Washer, T. J. BURKE, 329 E. 2d St. LOS ANGELES, CAL.



Designed and Manufactured by
T. J. BURKE, 329 E. 2d St.
LOS ANGELES, CAL.

Applications for Patents Pending in the United States, Canada, and Mexico. Filed in the Patent Office at Washington, February 2d, 1898.

No Screens, nor Grizzlies; handles all material from the grass roots to hard rock; A perfect miners device; Works under water or on the dry bar. Weight 7 pounds; can be taken apart and packed in a grip sack.

W. A. RUSSELL,
Special Agent for the State
of California
441 South Broadway,
LOS ANGELES, CAL.



For full particulars as to Foreign territory

Address

T. J. BURKE,

329 E. 2d street

Los Angeles, Cal.

A. L. FISH, AGENT FOR

Buckeye Engines
Roots Rotary Pump
Highest Efficiency Guaranteed
Especially adapted to Electric Motor use
HAS FOR SALE CHEAP—A First-Class Air Compressor, (Steam Driven) and Drill (new), also Three-Ton Capacity Pulverizer.
59-61 FIRST STREET, SAN FRANCISCO

TIMOTHY W. SPRAGUE, S. B.

WITH

CHARLES HENRY DAVIS, C. E.
CONSULTING ENGINEERS

99 CEDAR ST., NEW YORK & STATE ST., BOSTON
DREXEL BLDG., PHILADELPHIA
Electric Transmission of Power and Mine Equipments

E. C. WOODWARD,

Assayer and Chemist

Telephone 315

24 E. Kiowa St., Colo. Springs, Colo.

KLONDIKE
WANTED—Men and Women to know the cheapest, easiest and best route to KLONDIKE. How to go and make expenses on the way. Circular free for stamp. Agents wanted for all over U.S.
G. W. MOODY,
1024 First St., Portland, Or.

THEODOR LEXOW

105 Broadway New York
Importers of

CARBONS

FOR
DIAMOND DRILLS and all Mechanical
Purposes
Henry Demmert

I. C. YAWGER,

SUCCESSOR TO
VICTOR BISHOP & CO.



21 MAIDEN LANE

NEW YORK

**DENVER PUBLIC ---
SAMPLING WORKS,**

M. E. SMITH, PRESIDENT.

ORES SOLD ON THE
PUBLIC MARKET. Denver, Colo.

Miners Attention!

We Sell Powder, Caps, and Fuse, Mining Machinery, Belting, Asbestos Goods, packing of all kinds, Picks and Shovels, Iron and Steel; Iron Wheelbarrows, Ore Sacks, Tents, Portable Forges and General Mining Supplies. Agency Truax Mfg. Co and Studabaker Wagons.

WILCOX & ROSE CO.,

San Bernardino, Cal.

HOME MANUFACTURE
POWLER'S

Fossil Asbestos Manufacturing Co.,
Sectional Removable Covering
for Steam Boilers, Pipes, etc.
As a Non-Conductor, Unequaled
Absolutely Fire Proof

G. C. FOWLER, 156-58 Howard Street,
San Francisco, Cal.



HOFF ASBESTOS MFG. CO., Bryson Block,
Los Angeles, Cal., Agent for Southern Cal.

H. P. G. COATES,
MINING AND DIVIDEND PAYING STOCKS,

Reliable Information on Application

SALT LAKE CITY, UTAH

FULTON ENGINE WORKS
Mining, Milling & Smelting Machinery

Estimates Furnished on 1 Classes of Mining Work

P. O. Box 298, STATION "C"

LOS ANGELES, CALIFORNIA

SPARKS! SPARKS!!



No more trouble to
ignite your
gas engine.
Always
sure of a
good spark
with our
dynamo.
For particu-
lars address

AZELSON MACHINE COMPANY,

1110-3-5 North Main St., LOS ANGELES, CAL.

S. H. ELLIS,

Mines and Mining
Stocks, Safe
Investments

213 Stimson Bldg., Los Angeles, Cal.

THOMAS J. DEE & CO.

Gold and Silver Refiners and Assayers

67 and 69 Washington St.,

Bullion Bought and Sold

CHICAGO, ILL.

ESTABLISHED 1888
JONES ASSAY OFFICE
DENVER, COLORADO
HAS A WORLD-WIDE REPUTATION FOR
ACCURACY AND RELIABILITY
Send for price list. Mention this paper.

Sterne Bros.,

MACHINISTS AND
FOUNDERS

Mining Machinery, Engines, Boilers and
Pumps.....

Repairing Promptly Done.

SAN DIEGO, CAL.



The Bartlett Concentrating Table

Capacity 10 to 30 tons daily; size 4x8 feet;
weight 800 lbs. Clean separation of all minerals
without sizing. Price \$250. Send for description.

American Zinc Lead Co.,
CANON CITY, COLO.

Subscribe for :::

::: The Journal

**Mexican, American and Foreign Patents,
TRADEMARKS, ETC.**

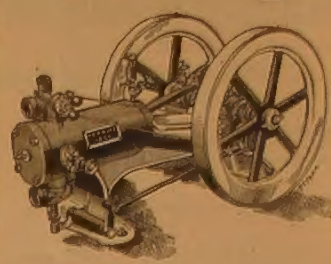
Reports on Mining and Other Properties.
Proprietors of Weekly Anglo-American, a first-class Advertising Medium.
Established 8 Years.

C. H. M. y Agramonte,

P. O. Box 388. Cable Address, "Agra"

CITY OF MEXICO, MEXICO

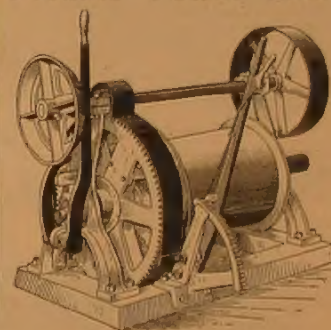
PERKINS Gas Engine



MODEL OF 1897

Composed of Sixteen parts, constructed so plain and substantial that it may be taken to the desert mines without fear of unreliable operations, uses Storage and Dynamo for sparking, the cooling jacket water is used over. Uses about 8-10 of a gallon of gasoline for each horse power for a twelve-hour run. Ten horse power engine weighs 2250 lbs. boxed for shipment.

Perkins Power Hoist



Is light and portable weighing 1050 lbs., heaviest piece weighs 150 lbs., capacity 1000 lbs. one hundred foot per minute, will lift 400 feet. A Safety latch follows every foot of the lift, guaranteeing absolute safety.

PRICE \$125.00

For full particulars, apply to

Perkins Pump and Engine Co.

1023 N. Los Angeles St., Los Angeles

L. J. Lassell,
ASSAYER & CHEMIST

All Orders by mail promptly attended to and accuracy guaranteed. Prices on application.

KINGMAN, - - - ARIZONA

SIMONDS & WAINWRIGHT,

Chemical and Mining Engineers and Analysts

Working tests of Ores by all Processes. Experimental Work on Chemical and Metallurgical Processes. Instructions in Assaying and Chemistry.

No. 20 Platt Street, New York

THE PUEBLO Smelting and Refining Company,

PUEBLO, COLORADO.

BUYERS OF
Gold, Silver, Lead and Copper Ores,
Copper Matte and Bullion.

Refiners of Gold, Silver, Lead and Copper.

Manufacturers of Bar and Pig Lead, Lead Pipe, Antimonial Lead, Copper Ingots,
Granulated Test Leads and Litharge.

Pays Highest Prices for all classes of Ores.

Especial Attention to Sampling by most Approved Processes.

Quick Returns on all Consignments.



CHAS. B. BOOTHE & CO.

MINING AND MILLING MACHINERY AND SUPPLIES,

Hoists, Horse Whims, Buckets, Wire Rope, Ore Cars

129 SOUTH LOS ANGELES STREET,

LOS ANGELES, CAL.

FRANK H. HOWE,

MECHANICAL ENGINEER

Boilers, Engines, Pumps, Complete Steam and Oil Burning Plants

Mill and Mining Machinery

135 West Second Street, Los Angeles, Cal.

RISDON IRON WORKS,

SAN FRANCISCO, CALIFORNIA

Cable Risdon's, Code—A. B. C. & Leibers

MANUFACTURERS OF

GOLD DREDGING MACHINERY AND COMPLETE EQUIPMENT for Placer Mines, OUR SPECIALTY.

We build Gold Dredges Complete in Running Order to handle 2,500 cubic yards per day at a cost of 3 cents per cubic yard.

We excavate 50 feet below water, 20 feet above water and handle boulders up to one ton weight. Send for Dredging Catalogues Nos. 15 and 16.

We also build all kinds of Mining, Milling Concentrating, Pumping, Air Compressing, Hydraulic, Water Wheel and Hoisting Machinery.

EVANS' HYDRAULIC GRAVEL ELEVATORS.

We publish 16 Catalogues. Write for one in the line you are interested in.



The Mining Metallurgical Journal



Has its Offices | STIMSON BLOCK, LOS ANGELES, CAL., and
64-66 MERCHANTS' EXCHANGE, SAN FRANCISCO, CAL.

Write for Advertising Rates

Do you Want **MINING AND MILLING MACHINERY** and do you want **QUICKLY** to get it

If You Do, Address

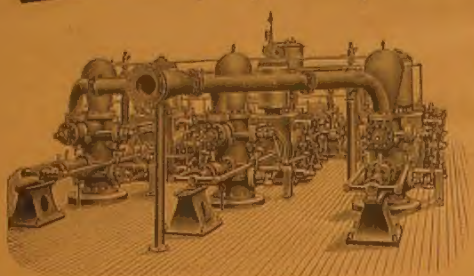
Fraser & Chalmers, 133 FULTON STREET, CHICAGO

whose works are exclusively devoted to and adapted for the manufacture of Mining and Ore Reducing Machinery.

During the month of January, 1898, Fraser and Chalmers' Chicago Works received orders for Mills amounting to a total of

Eight Hundred and Fifteen [815] Stamps

and it is significant of their resources that even with this great amount of work in hand, they are still in position to contract for additional work for which **QUICK SHIPMENT** can be made.



JOSHUA HENDY MACHINE WORKS, Nos. 38 to 44 Fremont St. SAN FRANCISCO, CAL.

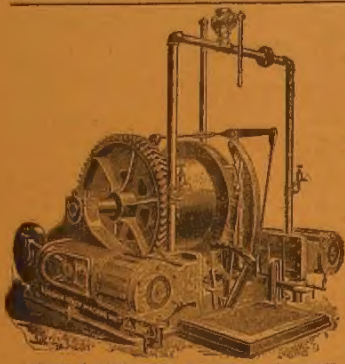
Manufacturers of and Dealers in

All the Latest Improved

Quartz Milling, Pumping, Smelting and Electrical Machinery, Boilers & Engines OF ALL POWERS, Mine and Mill Supplies.

BUILDERS of "HENDY" IMPROVED "TRIPLE-DISCHARGE" TWO-STAMP MILLS

PLANS, SPECIFICATIONS and ESTIMATES OF COST FURNISHED and CONTRACTS MADE FOR FURNISHING and ERECTING MINING and MILLING PLANTS for all conditions of Use.



DOUBLE CYLINDER HOISTING ENGINE

BAKER IRON WORKS

LOS ANGELES, CALIFORNIA

Manufacturers of

Mining and Milling Machinery, Atlas Engines and Boilers, Worthington Steam Pumps

Water Works Machinery A SPECIALTY

MINING ENGINES
Double AND Single Drum

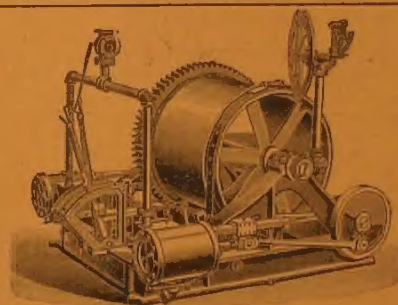
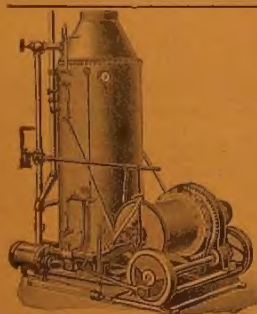
— ALSO —

Hoisting Engines and Electric Hoists for Every Known use

LAMBERT HOISTING ENGINE CO.

125 POINIER STREET,

NEWARK, N. J.



Mining Timbers and Construction Lumber

(Calcutta Long Leaf Yellow Pine Lumber)

Prices given for delivery to any point in Mexico by Rail through Porfirio Diaz, Nuevo Laredo or Paso del Norte, and by Vessel through Gulf Ports of Tampico and Vera Cruz.

Bradley-Ramsay Lumber Co.

LOUISIANA, U. S. A.

ADDRESS INQUIRIES FOR PRICES TO

R. N. WATSON, AGENT.

APARTADO NO. 118 MONTERREY, N. L. MEXICO

PARKE & LACY COMPANY

21 and 23 Fremont St., San Francisco, Cal.



MINING MACHINERY

SOLE AGENTS FOR THE INGERSOLL-SERGEANT AIR COMPRESSORS AND ROCK DRILLS.

SOLE LICENSEE FOR THE MANUFACTURE AND SALE OF

THE ROPP STRAIGHT LINE FURNACE, For Roasting, Chlorinating and Desulphurizing Ores.

WE CARRY IN STOCK

Horizontal, Vertical and Portable Engines and Boilers. Rock Breakers, Cornish Rolls, Pulverizers, Concentrators, Ore Feeders. Hoisting Engines, Horse Power Hoisting Whims, Water Wheels, Steam Pumps, Ore Cars, Wire Rope, Ore Buckets, Water Buckets, Skips. Blowers and Exhaust Fans, Shafting and Pulleys, Belting, Oils and Mine Supplies. **Maganese Steel Shoes and Dies**

Estimates Furnished for Complete Plants for Hoisting Works, Smelters, Concentrating and Stamp Mills.

